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GOVERNMENT OF INDIA
TARIFF COMMISSION

REPORT

ON

The Continuance of Protection to the Piston Assembly Industry

BOMBAY 1966

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GOVERNMENT OF INDIA

MINISTRY OF COMMERCE

New Delhi, the 19th Nov. 1966

RESOLUTION

Tariffs

No. 15(1)-Tar/66.—The Tariff Commission has submitted its Report on the continuance of protection to the Piston Assembly Industry on the basis of an inquiry undertaken by it under Sections 11(e) and 13 of the Tariff Commission Act, 1951 (50 of 1951). Its recommendations are as follows :—

(1) Protection to the piston assembly and its components covered by I.C.T. item No. 75(12A) should be continued for a period of three years ending 31st December, 1969 at the existing rates of duty.

(2) Unless a large expansion of the automobile industry is planned, all requests for licences for production of piston assemblies and components should be carefully considered. *Prime facie,* there is no scope for further expansion of the industry and with the number of existing and prospective units there should be a reasonable measure of competition within the country.

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(3) The Directorate General of Technical Development should endeavour to arrange for a steady source of pig iron of the rigid metallurgical composition required by the piston assembly industry since off grade pig iron leads to wastages and raw material losses.

(4) The research work done at the National Metallurgical Laboratory for producing magnesium should be fully exploited to reduce our dependence on imports for this metal and research should be conducted to develop a process for manufacturing silicon for which the basic raw material is available in the country.

(5) Since equally good results can be obtained by forging cast billets of hypereutectic alloy made indigenously, careful examination is needed whether imported hypereutectic extruded bars are an indispensable raw material for Tata Mercedes-Benz pistons.

(6) Reduction of cost of production of aluminium and a check on the producer's profit are much to be desired. This would need a careful study of each element of cost from mining and reduction of ore to transport charges and electricity rates. Due attention would also have to be paid to the location and size of future units of the industry, and the expansion of existing units to their optimum sizes. The Commission, therefore, reiterates the need for a national policy in regard to this important metal, which with steel, would affect the competitive capacity of many Indian Industries.

(7) It would be desirable for Government to arrange through Directorate General of Technical Development that manufacturers supply piston assembly and its components direct to all big consumers (even if a commission has to be paid to an authorised dealer on these supplies) so that supplies made to authorised dealers do not become a source of profiteering.

(8) When a manufacturer of piston assembly and its components cannot supply a public utility concern with its requirements within, say six months, necessary import licences should be issued to cover its reasonable requirements.

(9) The study of the trends of costs in piston assembly industry reveals prospects of economies of size and that there is a great need for careful cost accounting and for watch over each component of the costs of production.

(10) Escorts Limited and Goetze (India) Ltd., should take early steps to introduce a proper cost accounting system and budgetary control for the purpose of reducing costs of manufacture.

(11) Piston assembly industry, in common with all industries, has revealed steady rises in the cost of production and selling prices, which may to some extent

be due to the assurance of protected market. The time has come for concerted effort to reverse this nation-wide trend. Producers on their part should make every endeavour to bring down costs and for that purpose main adequate system of cost accounting to assess both their financial and technical progress.

(12) A significant reduction of costs in the piston assembly industry will undoubtedly lead to the opening of export markets not only in this part of the world but even in Europe where the automobile ancillary industries are unable to keep pace with the expansion of the automobile industry.

(13) Since there is scope for reduction in the selling prices of authorised dealers, the manufacturers of piston assembly and components should examine their pricing policy and make suitable reductions in their selling prices, wherever possible.

(14) The selection of cylinder bore diameters for internal combustion engines is a matter having a direct bearing on the design and performance of engines and needs careful examination by the engine manufacturers. The engine manufacturers may give due consideration to the suggestion of the Indian Standard Institution made in paragraph 10.1.2 of the Report for adoption of preferred sizes of cylinder bores (dimensions in millimeters) mentioned below for future engine designs—

30, 32, 35, 36, 40*, 45, 50, 55, 56, 60, 63, 65, 70, 71, 72, 75, 80*, 85*, 90*, 95*, 100*, 105, 112, 115*, 120, 125, 130, 135, 140, 145, 150, 155, 160, 170, 175*, 180, 185, 190, 195 and 200.

(The diameters marked asterisk are already in use).

2. Consequent on devaluation of the Indian currency, the Tariff Commission, at the instance of Government, reconsidered its recommendation (1) and has come to the conclusion that it is not necessary to continue protection to the piston assembly industry beyond 31st December, 1966. Government accept this revised recommendation and it has been decided to de-protect the industry with effect from 1st January, 1967. Government have decided to maintain the effective rate of revenue duty after de-protection at the same level as the

effective rate of existing protective duty. Necessary legislation to implement Government's decision will be undertaken in Parliament in due course.

3. Government have taken note of recommendations (2) to (9) and suitable steps will be taken to implement them to the extent possible.

4. The attention of Escorts Ltd., and Goetze (India) Ltd., is invited to recommendation (10) and that of the producers of piston assembly to recommendation (11).

5. The attention of the industry is drawn to recommendation (12), the manufacturers of piston assembly and components to recommendation (13) and the engine manufacturers to recommendation (14).

ORDER

Ordered that the Resolution be published in the Gazette of India and a copy thereof communicated to all concerned.

सत्यमेव जयते

(B. N. BANERJI)

Special Secretary to the Government of India.

CONTENTS

PARA-GRAPH | PAGE

1 Previous tariff inquiries and present inquiry . . 1
2 Method of inquiry 2
3 Scope of inquiry 3
4 Implementation of the Commission's recommendations made in its last Report (1963) . . . 4
5 Present position of the industry 9
6 Capacity and production 17
7 Domestic demand 22
8 Raw materials 31
9 Cost of virgin aluminium 34
10 Standards and quality 36
11 Import control policy and imports . . . 40
12 Exports 44
13 Existing rates of duty 45
14 Cost of production and fair ex-works prices . . 47
15 Trend of costs 58
16 Comparison of fair ex-works prices with c. i. f. prices and landed costs (ex-duty) of imported products . 59
17 Selling system and selling prices 61
18 Views on protection 63
19 Ancillary recommendations 65
20 Summary of conclusions and recommendations . 66
21 Acknowledgements 69

सत्यमेव जयते

TABLES

1 Capacity of large scale units 17
2 Capacity of units for self-consumption . . . 18
3 Capacity of the small scale sector 18
4 Total capacity of the piston assembly industry . 19
5 Additional licensed capacity 19
6 Total capacity of the industry after expansion . 20
7 Production of pistons, piston rings and gudgeon pins 20
8 Apparent consumption of pistons, piston rings and gudgeon pins 23

PAGE

9 Statement showing the estimates of demand as furnished by India Pistons, Escorts, Goetze and D.G.T.D. 26
10 Vehicle population as on 31-3-1965 27
11 Vehicle production in 1965 28
12 Projected rate of production of vehicles and engines 28
13 Estimates of demand for 1966 and 1968 . . 29
14 Estimates of demand for gudgeon pins . . . 29
15 Estimates of demand for pistons 30
16 Estimates of demand for rings during 1966 . . 30
17 Estimates of demand for rings during 1968 . . 31
18 Installed capacities for aluminium castings and forgings 32
19 Production of castings and forgings . . . 32
20 Prices of aluminium ingots 35
21 Prices of aluminium alloy 35
22 Imports of piston assemblies and their components 43
23 Exports of pistons and piston rings . . . 44
24 Existing rates of duty 45
25 Fair ex-factory prices of pistons 53
26 Fair ex-factory prices of piston rings . . . 55
27 Comparison of fair ex-factory prices of indigenous products with c.i.f. prices of imported products . 60

APPENDICES

I. List of parties to whom questionnaires/letters were issued and from whom replies or memoranda were received 71
II. List of factories visited by the Commission and its officers 79
III. List of persons who attended the Commission's public inquiry on 15th March 1966 . . 80
IV. Statement showing production of pistons, piston rings and gudgeon pins 83
V. Statement showing Principal raw materials purchased 85
VI. List of models for which import of piston assemblies were restricted 87
VII. Statement showing c.i.f. prices and landed costs of piston assembly and its components . . 89

REPORT ON THE CONTINUANCE OF PROTECTION TO THE PISTON ASSEMBLY INDUSTRY BEYOND 31ST DECEMBER, 1966

1. Previous tariff inquiries and present inquiry.

1.1. The first inquiry into the claim of piston assembly industry for protection was held in 1955, under Section 11 of the Tariff Commission Act, 1951, as a sequel to the suggestion in paragraph 12(c) of the Commission's Report on protection to the Automobile Industry (1953) that the case of each automobile ancillary industry should be examined separately. Trunk piston assemblies being an important ancillary of internal combustion engines the first inquiry covered non-vehicular engine piston assemblies as well. As a result of this inquiry protection was granted to the piston assembly industry till 31st December 1957, by levy of a protective duty of 50 per cent *ad valorem* standard on trunk piston assemblies of 6″ (153 mm.) diameter and below and piston rings (excluding chromium plated rings) and gudgeon pins required for such piston assemblies imported separately, provided that such articles were adapted for use as parts and accessories of internal combustion engines but excluding those adapted for use exclusively as parts and accessories of engines of agricultural tractors and aeroplanes. The preferential rate of duty was fixed at 42½ per cent *ad valorem* in accordance with the India-U.K. Trade Agreement.

1.2. The second inquiry into the piston assembly industry was held in 1957 and the Commission recommended continuance of protection to the industry up to 31st December 1960 at the then prevailing rates of duty. This was accepted by Government. The third inquiry into the industry was held in 1960 and the Commission's recommendation regarding the continuance of protection at the then existing rates of duty upto 31st December 1963 was accepted by Government. In 1957 the Commission had considered that it was premature and not necessary to extend the scheme of protection to chromium plated rings and cylinder liners. During the inquiry held in 1960 the scope was extended to include chromium plated rings also. On that occasion it was also represented to the Commission that cast iron pistons and gudgeon pins should be excluded from the scope of protection but the Commission did not find it necessary to do so.

1.3. The Commission's last inquiry, *i.e.*, the fourth in the series, was held in 1963 and in its Report submitted in May 1963 the Commission recommended that the protection to the piston assembly industry should be continued at the then existing rates of duty upto 31st December, 1966. Government accepted the Commission's recommendation *vide* Ministry of International Trade Resolution No. 15(1)Tar/63, dated 24th October, 1963.

1.4. Since the protection to the piston assembly industry is due to expire by the end of this year the present inquiry has been undertaken under Section 11(e) read with Section 13 of the Tariff Commission Act, 1951, which empowers the Commission to inquire into, and report on, any further action required in relation to protection granted to an industry with a view to its increase, decrease, modification or abolition according to the circumstances of the case.

2. Method of inquiry

2.1. Following our usual practice, detailed questionnaires were issued to producers, prospective producers, consumers and their associations and importers of piston assemblies in December 1965. The Director General of Technical Development (D.G.T.D.) and the Development Commissioner, Small Scale Industries were requested to furnish detailed memoranda regarding the progress and present position of the industry in their respective sectors. The Iron and Steel Controller was requested to furnish information regarding the present supply position of pig iron. The indigenous aluminium and its alloy manufacturers and Hindustan Steel Ltd. were requested to furnish information regarding availability, prices and supply position of aluminium, its alloys and pig iron. The Indian Standards Institution was requested to indicate the progress made in formulation of standards for products covered by the present inquiry. The Collectors of Customs at Bombay, Madras, Calcutta and Cochin were requested to furnish the latest c.i.f. prices, customs duty, landed costs, etc., in respect of the imported piston assemblies and their component parts. Copies of consumers' questionnaires were forwarded to the Ministry of

Defence and the Directorate General of Supplies and Disposals for replies to the questions raised in the questionnaires in respect of purchases made by their Departments. The Directors of Industries of the Madras and West Bengal Governments as well as the Chief Commissioner, Delhi Administration were requested to submit memoranda on the present position of the industry in their States with special reference to the availability of raw materials, assistance rendered to the industry, quality of the indigenous products, etc. Letters were issued to the State Governments for their views in case they were interested in this inquiry. The Ministry of Transport and Communications was requested to furnish the latest figures of vehicles on road in India. The National Metallurgical Laboratory and the Council of Scientific and Industrial Research were requested to inform us whether any research has been done to develop processes for manufacture of silicon and magnesium which are alloying elements, at present imported. A press note was issued in January 1966 inviting interested parties to furnish the Commission with their views. A list of firms and bodies to whom questionnaires/letters were issued and from whom replies or memoranda were received is given in Appendix I.

2.2. Escorts Ltd., New Delhi, Goetze (India) Ltd., New Delhi and India Pistons Ltd., Madras were selected for the purpose of cost investigation. Our Cost Accounts Officers have examined their cost of production.

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2.3. A list of factories visited by the Commission and its officers in connection with this inquiry is given in Appendix II.

2.4. The Commission's public inquiry into this industry was held on 15th March 1966. A list of persons who attended the inquiry is given in Appendix III.

3. Scope of inquiry

3.1. The present scheme of protection covers articles mentioned in the Indian Customs Tariff Item No. 75(12A), namely, (i) trunk piston assemblies of diameter 153 mm. and below, (ii) trunk pistons of diameter 153 mm. and below, (iii) trunk piston rings (including chromium plated rings) of diameter 153 mm. and below and (iv) gudgeon pins for trunk pistons of diameter 153 mm. and below adapted for use as parts and accessories of internal combustion engines of all kinds, but excluding such articles as are adapted for use exclusively as parts and accessories of internal combustion engines of agricultural tractors and aeroplanes.

3.2. We have received replies only from the three major and twelve small scale producers and none of them has made any request for either extending or limiting the scope of the present inquiry. About the scope, Escorts Ltd. and Goetze (India) Ltd., suggested a study of the effects of recent Fiscal Laws pertaining to import entitlements against remittance from abroad and the liberal import of piston assemblies against such entitlements with particular reference to the installed capacities and the demand in the coming years. During the inquiry however it transpired that since imports under these entitlements were subject to contemporaneous import policy the net result was an increase in the availability of foreign exchange and that since this was of small dimensions the proposed study would have no serious significance. Shama Pistons and Rings Ltd., which has yet to set up production has requested continuance of the present scheme of protection. We have decided to restrict the scope of the inquiry to the items now under a protective tariff.

4. Implementation of the Commission's recommendations made in its last Report (1963).

4.1. The Commission's recommendations in its last Report on matters other than the continuance of protection and the extent to which each of them has been implemented are indicated below.

4.2. "In view of the rising targets of demand and the installation of capacities of new units before 1965-66 not being likely, expansion plans of established producers should be expedited and priority accorded to them for the release of foreign exchange as the raising of their capacity is quicker and would involve lesser additional cost and foreign exchange."

We understand that the existing firms have been permitted to expand their capacities and that the required foreign exchange has been released to them for import of capital goods for implementation of their expansion programmes. Details about expansion programmes of various units are given under paragraphs 5.4 and 6.1.5.

4.3. "In order to remove the complaints of producers, the list of restricted categories of pistons (Appendix 26, Annexure A of the Red Book) should be revised so that indigenous industry may be helped and the import restrictions be relaxed where the small and special requirements of customers cannot be economically met by the indigenous producers."

4.3.1. We have been informed that the import policy is made restrictive in every licensing period to the extent possible based on the current production of indigenous firms. The import control policy regarding piston assembly is given under paragraph 11.1. According to it, Annexure A of Appendix 26 has been removed from the April 1964-March 1965 licensing period. According to the Public Notice No. 68-ITC(PN)/64 dated 10th August 1964 the import control policy in respect of piston assemblies was amended to remove the restriction of 25 per cent from within the quota of 40 per cent to be utilised for import of aluminium piston assemblies of 6″ diameter and less (including over sizes).

4.3.2. India Pistons Ltd. has stated that since the last inquiry there have been further restrictions on imports but it has complained that while under current policy the quota has been reduced from 16 2/3 to 5 per cent the face value restrictions for aluminium piston assemblies have been liberalised from 40 to 60 per cent and restrictions on import of specific models have also been removed. It has also stated that its present experience is that a majority of importers are utilising their licences for importation of piston assemblies suitable for popular types of engines. The company has, therefore, requested that import trade control policy be made more effective in preventing import of items for which indigenous manufacturers are adequately equipped. Regarding piston rings the company has said that although under the present policy import of piston rings has been virtually banned a lacuna still exists in as much as certain established importers are being permitted to import popular ring sets like Perkins P-6 as spares for agricultural tractors and earth moving equipment. In the opinion of the company it would be preferable if the Import Trade Control Authorities were to specifically refer to the indigenous manufacturers cases where import of such types are involved so that they could give an indication as to whether or not import would be necessary.

4.3.3. Escorts Ltd. has informed us that although no new list as recommended by the Tariff Commission has been included in Appendix 26 of the I.T.C. policy during the last two periods the present quantitative restrictions are conducive to the development of the industry.

4.3.4. Goetze (India) Ltd. has also informed us that the last two I.T.C. policies do not contain any list of restricted categories of piston assemblies but the quota restrictions meet the small and special requirements of customers.

4.4. "Manufacturers of piston assembly should be allowed every facility to obtain adequate and timely supply of raw materials, especially where some part of it is to be imported so as to reduce production costs. A tendency to mark-up prices of automobile spares at 70 per cent or 100 per cent over landed costs of imported products is not justified particularly when a higher rate of protective duty is taken as part of landed cost. Producers should not show any complacency in regard to their performance by comparing their current selling prices with such mark-up over landed cost including duty of imported products."

4.4.1. All the three firms state that they have been obtaining good assistance from the D.G.T.D. in overcoming difficulties in procurement of items which necessarily have to be imported due to their non-availability in the country and that except for delays in the issue of import licences they have no complaint. We have also satisfied ourselves that while prices range from 7 to 56 per cent over landed costs including duty there is at present no uniform high mark-up over them.

4.5. "The authorities should consider the case of this industry favourably and ensure that its output does not fall on account of shortage of raw materials."

The main complaint here would appear to be the inability of manufacturers to supply pig iron of low phosphorous content and the wide variations in specifications of pig iron supplies. We would recommend that the D.G.T.D. should endeavour to arrange for a steady source of pig iron of the rigid metallurgical composition required by the industry since off grade pig iron leads to wastages and raw material losses. Raw material problems of the industry are further discussed under paragraph 8.

> 4.6. "The companies should spare no pains to locate proper sand for their foundry and ensure the resulting economy."

Both India Pistons Ltd. and Goetze (India) Ltd. have located good sources of foundry sand and do not anticipate any difficulty on this account.

> 4.7. "As the producers are quality conscious the need to take effective steps to eliminate complaints has been impressed upon them."

4.7.1. India Pistons Ltd. has stated that in its constant endeavour to improve the quality of its products it has implemented the following:

(i) It has formed a "Quality Control Committee" consisting of the Chief Inspector, Production Manager, Foundry Manager and the Service Engineer. This Committee meets once a month to review the quality standards maintained throughout the operations within the company and also customers' complaints. The preventive and corrective measures recommended are followed up by this committee and promptly implemented.

(ii) It has started a Service School to train mechanics to level up the quality of engine re-conditioning and eliminate complaints due to defective method of engine re-conditioning even when supplied with quality products.

(iii) It is operating a full fledged SQC Department in all phases of production from the raw material to the finished product.

4.7.2. Escorts Ltd. has informed us that endeavours have been made to implement the Commission's recommendation and its considered opinion is that all the engine manufacturers who are currently using its products are fully satisfied with the qualtiy of the pistons.

4.7.3. Goetze (India) Ltd. has stated that the low level of rejection is ample testimony to the excellent quality of the piston rings supplied by it directly to the engine manufacturers and through its sole selling agents. The company also states that continuous vigilance is maintained to control the quality at the prevailing levels besides exploring avenues to improve it by stricter inspection.

4.8. "Having regard to the scope of price reduction and the example of certain other protected industries which have made periodic price reduction, producers of this industry should also follow such example."

All the three firms state that they have followed a careful price policy and maintain their prices at low levels despite increases in all elements in the cost of production, particularly of virgin aluminium and alloys the cost of which has gone up rapidly since the middle of 1965. However, there were significant increases of prices in the latter part of 1965. They have also stated that the small volume of demand, particularly of some types of products, place them at a disadvantage compared with foreign producers, whose large outputs give them economies of scale not available in this country at present.

4.9. "Cost reduction being a continuous process, such producers as have not already introduced it, should maintain a proper system of cost accounting to assess both their financial and technical progress."

4.9.1. India Pistons Ltd. has informed that it has introduced detailed procedures for collection of classified cost data relevant to the different department and these are integrated with and built into the monthly financial accounts. The techniques of standard costing and budgetary control are being progressively perfected with an eye on reducing cost and increasing productivity. The Company has also constituted a Cost Improvement Programme Committee to provide a forum for the Divisional Heads to focus their attention on potential cost saving measures. It has also a suggestion scheme whereby practical suggestions from workers are received, screened and if accepted rewarded on merits.

4.9.2. Escorts Ltd. and Goetze (India) Ltd. have informed us that since the last inquiry they have improved their cost accounting, and that the design as well as the method employed by them in costing is on lines similar to those employed by the Commission's Cost Accounts Officer during its last inquiry. They have further stated that they do not require any assistance from the Government or any other body to set up a system of cost reduction. However, we are of the view that the system in use is not at all adequate and that in consequence their check over costs is incomplete and inadequate. Cost accounting and standard costing have become valuable tools to efficient management of which these firms should make the fuller use. We have discussed this further in paragraphs 14.1.3. and 14.1.4.

5. Present position of the industry.

5.1. We have divided producers of piston assembly into the following three categories:

(i) Large scale units manufacturing piston assemblies for sale.

(ii) Automobile and engineering units producing for self-consumption.

(iii) Small scale units.

The present position of the industry is therefore given under these heads.

5.2. *1963 inquiry:*

5.2.1. *Units manufacturing piston assemblies and components for sale.*—At the time of the last inquiry in 1963 three units were licensed under the Industries (Development and Regulation) Act, 1951 and were producing piston assembly and its components for sale to different consumers. These were as under :

Name of the unit	*Items produced*
1. India Piston Ltd., Madras . . .	Pistons, piston rings and gudgeon pins.
2. Escort Ltd., Delhi	Pistons.
3. Goetze (India) Ltd., Delhi . . .	Piston rings.

5.2.2. We were also informed that two new units, namely, Niranjan Auto Pistons Ltd., New Delhi and Nathani Industries Pvt. Ltd., Bombay had been granted licences to manufacture pistons, piston rings and gudgeon pins but neither of them was in production at the time of the last inquiry.

5.2.3. *Units producing for self consumption.*—Apart from the above units some automobile and engineering units were reported to be producing some components of piston assembly for their own consumption. These were:—

1. Hindustan Motors Ltd., Calcutta.
2. Textool Company Ltd., Coimbatore.
3. Laxmiratan Engineering Works Ltd., Faridabad.
4. Kulko Engineering Works, Kolhapur.

5.2.4. *Small scale units.*—Piston assembly and its components were also reported to be produced in the small scale sector. The Development Commissioner, Small Scale Industries had reported that 79 small scale units were manufacturing piston assemblies, pistons, piston rings and gudgeon pins at the time of the 1963 inquiry.

5.3. *Present inquiry:*

5.3.1. *Units manufacturing piston assembly and components for sale.*—In connection with the present inquiry we have been informed that in the organised sector, India Pistons Ltd., Escorts Ltd., and Goetze (India) Ltd., continue to produce all the items for sale which they were producing at the time of last inquiry. As regards new units neither Niranjan Auto Pistons Ltd., (now known as Shama Pistons and Rings Ltd.) nor Nathani Industries Pvt. Ltd. have yet commenced production.

5.3.2. *Units producing for self consumption.*—We have received some information of automobile and engineering units which are producing components of piston assembly for their own consumption. As compared to large units mentioned above, production of these units is very small. Names of these units along with the items manufactured by them are given below:—

Name of unit	*Items manufactured*
1. Hindustan Motors Ltd., Calcutta . .	Pistons and gudgeon pins.
2. Laxmiratan Engineering Works Ltd., Faridabad.	Pistons.
3. Cooper Engineering Ltd., Satara . .	Pistons.
4. Acme Manufacturing Co. Ltd., Bombay	Pistons and gudgeon pins.
5. Textool Co., Coimbatore . . .	N.A.
6. Kulko Engineering Works, Kolhapur .	N.A.
7. Western Railway	Piston rings and gudgeon pins.
8. Shri Gurunanak Engineering Co., Ghaziabad.	Pistons, piston rings and gudgeon pins.

5.3.3. *Small scale units.*—As regards the small scale sector we have been informed by the Development Commissioner, Small Scale Industries that at present there are 68 units engaged in the production of piston assembly and its components.

5.4. Details about units in various categories are given under the following paragraphs.

5.4.1. *Existing units manufacturing for sale:*

5.4.1.1. *India Pistons Ltd., Madras.*—The Company was established at Madras in 1949 and commenced production in 1950. Its authorised capital was raised from Rs. 25 lakhs in 1949 to Rs. 30 lakhs in 1957 and to Rs. 100 lakhs in 1962. Its paid-up capital remained constant at Rs. 25 lakhs till 1963-64 and was increased to Rs. 37.5 lakhs during 1964-65, of which its holding company, Simpson and Co., owns nearly 75 per cent. It has entered into a 20 year foreign collaboration agreement with Associated Engineering Ltd., a well known British Group of piston manufacturers like Wellworthy, Hepworth, Bricomvo, etc. The collaboration agreement provides for the payment to the British firm of an engineering fee for technical know-how for all the products manufactured by India Pistons. During its fifteen years of existence, the Company has been able to reach a stage of self-sufficiency in castings and forgings for its pistons and most of the components that go into the manufacture of piston assembly. The range includes chromium plated, duaflex and expander rings, sand cast and centrifugally cast piston rings, die cast and forged pistons. It also manufactures other components of internal combustion engines such as wet and dry type centrifugally cast cylinder liners, general ferrous and non-ferrous castings, tappets, valve guides, valve seals, etc. Its first expansion programme which involved a substantial increase in the capacity of piston assemblies of diameter 153 mm. and below, was completed in 1961, at a cost of Rs. 58.17 lakhs. The Company has now embarked upon its second project of expansion which will be in two stages and raise its present capacity from 6 lakh to 15 lakh pistons, 6 lakh to 16.5 lakh gudgeon pins and 36 lakh to 90 lakh piston rings. The first phase is expected to be completed by the middle of 1966. The Company is also widening its range of manufacture from 153 mm. to 306 mm. The scheme costing over Rs. 150 lakhs is to be financed by an increase in equity participation of its foreign collaborators, to whom 108,750 shares of Rs. 10 each have been issued, thereby raising their holding from 16 2/3 per cent to 30 per cent of the capital. Apart from this, Associated Engineering Ltd., has advanced a loan of £.448,750 for purchase of plant and equipment to be repaid by way of exports of piston castings within seven years with interest at the rate of one per cent over the U.K. Bank rate. The Company has already been granted two import licences for the import of machinery valued at Rs. 92.36 lakhs in 1964. Under this second expansion scheme the Company has also plans to establish a Research and Development unit, which it claims will be the first of its kind in the Indian automobile ancillary industries. The unit has already entered the export market and during the years 1963, 1964 and 1965 exported goods worth Rs. 27,050, Rs. 1,43,208 and Rs. 4,22,020 respectively. Its exports have been mainly to European and Middle East countries. It considers prospects of export to be good provided virgin aluminium and its alloys are available at near world prices. During all these three years, the Company worked two shifts and employed respectively 1480, 1578 and 1638 workers.

5.4.1.2. *Escorts Ltd., New Delhi.*—The Company was first incorporated as a private limited company with the name of Escorts Agents (Private) Ltd. in 1957. It was converted into a public limited company under its present name in 1959. The authorised capital was twice raised first from Rs. 200 lakhs to Rs. 300 lakhs in 1960 and further to Rs. 450 lakhs in 1965. Its paid-up capital was increased from Rs. 88 lakhs in 1961-62 to Rs. 170 lakhs in 1964-65. Equity capital accounted for Rs. 134 lakhs of which Rs. 22 lakhs was issued as bonus shares. Its managing agents are Harparshad and Co. (P) Ltd., whose terms has been renewed with effect from 1st May 1965 for a further period of five years. It commenced manufacturing pistons at its factory at Bahadurgarh (Punjab) in 1960 in technical collaboration with the West German firm Mahle-Komm Ges. Stuttgart. Its collaboration agreement which is initially for a period of ten years, provides for the supply of special purpose machinery, furnishing of drawings, making available technical know-how, the use of its trade marks 'Mahle', training of Indian engineers and arranging inspection of indigenous products in their laboratory. The Company has been granted a licence to expand its present capacity of 300,000 pistons to 720,000 pistons. It has almost completed arrangements for the import of machinery worth Rs. 25 lakhs against a total loan of Rs. 41.5 lakhs sanctioned by the Industrial Finance Corporation. The machinery was expected to be received before March 1966 and this expansion scheme is likely to be implemented fully by the beginning of 1967. The Company has also been licensed to manufacture 660,000 gudgeon pins per annum. A major portion of the equipment for the machining of piston pins has already been received. The plant is expected to be commissioned in the third quarter of 1966. The Company has its own casting and forging plant. It has made a small beginning in exporting its products. During the years 1963, 1964 and 1965 the unit worked on two shifts, employing 301, 300 and 333 workers respectively. Besides pistons, the unit manufactures X-ray equipment, shock absorbers for automobiles as well as railway application, heating elements, tractors and agricultural implements, railway couplers and air brakes and razor blades.

5.4.1.3. *Goetze (India) Ltd., New Delhi.*—This is a subsidiary company of Escorts Ltd., New Delhi with authorised and paid-up capital of Rs. 100 lakhs and Rs. 26.69 lakhs respectively. Its holding company, Escorts Ltd. has a 50 per cent share in the capital. The production of piston rings was started in July 1957 and that of sleeves in October 1962 at its factory at Bahadurgarh. It has entered into a technical collaboration agreement with Goetzewerke Fr. Goetze A. G., West Germany, extending upto April 1975. Thereafter it would remain in force for a further period of five years until terminated by one of the parties. The foreign Company will supply all special machines for the production of piston rings, disclose from time to time all its latest and other methods of manufacture, supply technical data and also arrange for the testing of piston rings and sleeves manufactured by the Indian company in its Research Laboratory and test standards. The company may also use the patents and other processes of its collaborators. The unit has an installed capacity to produce 3,000,000 piston rings. Its expansion programme is scheduled to double this capacity to 60 lakh rings. Machinery and plant worth Rs. 3,59,200 will be supplied by its foreign collaborators against which the foreign firm is allotted 3592 equity shares of Rs. 100 each. The

D.G.T.D. has informed us that the unit has been granted in December 1965 a capital goods licence valued at Rs. 32.99 lakhs for import of machinery. This full expanded capacity is expected to be achieved by the end of 1967/beginning of 1968. The Company employed 313,307 and 274 workers during the years 1963, 1964 and 1965 and worked three shifts.

5.5. *New Units:*

5.5.1. *Shama Pistons and Rings Ltd., New Delhi.*—This is public limited company with a share capital of Rs. 48 lakhs, divided into equity shares of Rs. 32 lakhs and preference shares of Rs. 16 lakhs. The company has entered into foreign collaboration agreements with (i) Karl Schmidt, GmbH of West Germany for 10 years for the manufacture of pistons and pins and (ii) Etablissements SIM S. A., Morges of Switzerland for 7 years for the manufacture of rings. The foreign firms will provide complete know-how and send their specialists to India for erection of plant and machinery. They will also train the Indian personnel at their works. The company was granted licence in 1960 to manufacture per annum 300,000 pistons, 1,500,000 piston rings and 300,000 pins. The factory is to be located at Ghaziabad, U.P. The construction of the factory building has already started and the plant and machinery has been ordered. It has received import licence of Rs. 5 lakhs for the import of certain raw materials and parts. Trial production is expected to start in December 1966. Initially the firm proposes to manufacture piston assembly below 6" diameter for the popular makes of vehicles like Fiat, Willys Jeep, Perkins, Leyland, Mercedes-Benz and Ambassador and for tractors.

5.5.2. *Nathani Industries P. Ltd., Bombay.*—In April 1962, this unit was granted a licence to manufacture gudgeon pins, at a factory to be located in Maharashtra. The capacity of the firm has yet to be determined.

5.6. *Units producing for self-consumption:*

5.6.1. *Hindustan Motors Ltd., Calcutta.*—This automobile manufacturing unit machines pistons for its own use from indigenous castings. These castings are procured rough turned from India Pistons. Rings are obtained from other manufacturers. It, however, produces its own gudgeon pins. Its annual installed capacity for pistons appears to be 77,000 numbers and production during the years 1963, 1964 and 1965 was 43,000 numbers, 52,000 numbers and 68,000 numbers respectively.

5.6.2. *Laxmiratan Engineering Works Ltd., Faridabad.*—The unit manufactures pistons for its 6 H. P. single cylinder and 12 H. P. two cylinder oil engines. Its annual capacity for pistons is 4800 numbers on single shift. During the three years 1963, 1964 and 1965, it produced 3525, 3215 and 3825 pistons respectively. It procures piston rings and gudgeon pins indigenously. It has expressed difficulty in purchasing gudgeon pins of uniform quality.

5.6.3. *Cooper Engineering Ltd., Satara.*—This unit manufactures pistons required for its 5 H. P., 8 H. P. and upto 12.5 H. P. engines. Its installed capacity for pistons is 12,000 per annum. Piston rings and gudgeon pins are obtained from outside sources. It produced 5800, 6300 and 7700 pistons in 1963, 1964 and 1965 respectively. These pistons are manufactured out of special grade mechanite castings made in its foundry. Some essential raw materials like calcium silicide, chrom-x etc. are imported.

5.6.4. *Acme Manufacturing Co. Ltd., Bombay.*—The unit manufactures pistons and gudgeon pins for its 5 to 14 H. P. engines. Pistons and gudgeon pins are manufactured according to its monthly oil engine production programme (its installed capacity for diesel engines is 150 per month) and also to meet orders for spares as replacement for these engines. Its production of engines was 710 in 1963, 1097 in 1964 and 1215 in 1965. The unit states that it has manufactured a corresponding number of pistons and gudgeon pins plus 15 per cent to cater to the needs of the spare parts market. Its production of pistons with gudgeon pins, therefore, would be 820 in 1963, 1260 in 1964 and 1400 in 1965.

5.7. *Small scale Sector:*

5.7.1. At the time of the last inquiry, the Development Commissioner, Small Scale Industries had reported 79 units manufacturing piston assemblies and components in the small scale sector. He has now reported 68 units distributed as follows:—

Delhi ...	... 5
Madhya Pradesh	... 1
Maharashtra	... 1
Punjab ...	... 9
West Bengal	... 2
Gujarat ...	...35
Madras ...	... 5
Mysore ...	... 7
Rajasthan ...	... 3
Total:	68

The total capital invested by these units is Rs. 96.92 lakhs and provided employment to 1481 workers in 1965. According to him the quality of the products is reported to be satisfactory on the whole. Many of the units manufacture according to drawings and specifications supplied by the consuming industries. Some of these units are also equipped with quality control instruments. The Development Commissioner is of the opinion that since the last inquiry there has been a noticeable improvement in the quality of the products. Since most of the units produce against specific orders, they do not face any difficulty in marketing their products. Some of the units have selling agents. The main problem faced by these units is stated to be that of getting adequate raw materials like aluminium alloy, spring steel strips, etc. These materials they complain are available with much difficulty and at very high prices. According to gudgeon pins manufacturers, Tata steel is available only at high prices and is also not of the right specifications. Technical assistance is provided to these units by the Small Industries Service Institute, whenever approached by them. Some of the units are registered with Small Industries Service Institutes for participation in Government Purchase programmes. Besides, these units have also received raw material allocations and financial assistance from the State Governments. In Delhi, some of the units have taken financial help from the State Bank of India also. The units in Calcutta have also procured machinery on hire-purchase from the National Small Industries Corporation Ltd.

5.7.2. In our last Report a mention was made of 3 small scale units, *viz.*, Hindustan Pistons Ltd., Madras, Auto Piston Manufacturing Co., Amritsar and La Prenca Industries Pvt. Ltd., Bombay. We have received details from all these units and in addition we have received replies to our questionnaire from 9 other small scale manufacturers. The small scale producers supply their pistons and pins both as original equipment to manufacturers of engines and compressors and to the market to meet the replacement demand. The general complaint from small scale manufacturers is about difficulty in obtaining aluminium alloy for the pistons and steel for the pins which are not available at reasonable prices in the open market nor are their import licences adequate for the purpose. Some small scale units have also complained about difficulty in obtaining specialised imported machinery and tools.

6. Capacity and production

6.1. *Capacity:*

6.1.1. *Units manufacturing piston assemblies for sale.*—The total installed capacity of India Pistons, Escorts and Goetze on the basis of maximum utilisation of plant and machinery at the time of the last inquiry in 1963 was as follows:—

TABLE 1

Capacity of large scale units

(In numbers)

Pistons	
India Pistons Ltd.	600,000
Escorts Ltd.	300,000
TOTAL	900,000
Piston Rings	
India Pistons Ltd.	3,600,000
Goetze (India) Ltd.	3,000,000
TOTAL	6,600,000
Gudgeon Pins	
India Pistons Ltd.	600,000

There has been no change in the above installed capacity of these three units since the last inquiry.

6.1.2. *Units producing for self-consumption.*—Complete information about the capacity of engineering and automobile units for their own consumption is not available. However, on the basis of information collected by us the following is the capacity of each unit:—

TABLE 2

Capacity of units for self-consumption

(In numbers)

Name of units	Capacity for pistons
Hindustan Motors Ltd.	77,000
Laxmiratan Engineering Works Ltd.	4,800
Cooper Engineering Ltd.	12,000
Acme Manufacturing Co. Ltd.	N.A.
TOTAL .	93,800

Capacity for other items like pins or rings is not known. It may be seen that the total capacity of these units is very small as compared to units which are manufacturing for sale.

6.1.3. *Small scale units.*—According to the Development Commissioner, Small Scale Industries, the capacity of the small scale units for piston assembly and its components is as under:—

TABLE 3

Capacity of the small scale sector

(In numbers)

1. Piston Assembly	306,680
2. Pistons	237,440
3. Piston Rings	3,082,000
4. Gudgeon Pins	116,000

The production figures of the small scale sector are given in Table 7. It may be noted that production of pistons, piston rings and gudgeon pins in the small scale sector was 122,618 nos., 905,542 nos. and 160,560 nos. respectively in 1965. As compared to the production figures, the capacity figures of piston rings seem to be very high.

6.1.4. *Total capacity.*—A statement showing total capacity of all sectors of piston assembly industry is given below:—

TABLE 4

Total capacity of the piston assembly industry

(In numbers)

Particulars	Piston Assemblies	Pistons	Piston Rings	Gudgeon Pins
Units manufacturing for sale	..	900,000	6,600,000	600,000
Units producing for self-consumption . .	..	93,800	N.A.	N.A
Small scale units . .	306,680	237,440	3,082,000	116,000
TOTAL .	306,680	1,231,240	9,682,000	716,000

6.1.5. *Future expansion:*

6.1.5.1. *Units manufacturing piston assembly for sale.*—All the existing three units were granted licences for expansion even at the time of the last inquiry. Two new units were also granted licences. The additional licensed capacity of the five units is as follows:—

TABLE 5

Additional licensed capacity

(In numbers)

Name of the unit	Pistons	Piston rings	Gudgeon pins	Likely date of completion
India Pistons Ltd.	900,000 (600,000)	5,400,000 (3,600,000)	1,050,000 (600,000)	Most of the expansion by middle of 1966.
Escorts Ltd. .	420,000 (300,000)	..	660,000	Beginning of 1967.
Goetze (India) Ltd.	..	3,000,000 (3,000,000)	..	End of 1967 or beginning of 1968.
Shama Pistons and Rings Ltd.	300,000	1,500,000	300,0000	End of 1966
Nathani Industries Pvt. Ltd.	...........Not settled......................			
TOTAL .	1,620,000 (900,000)	9,900,000 (6,600,000)	2,010,000 (600,000)	

(Figures in brackets indicate the existing capacity).

Details about expansion programmes of these units have already been given under paragraph 5.4.1. If the programmes of all the first four units are completed as scheduled the total capacity of these units by 1968 will be as follows:—

TABLE 6

Total capacity of the industry after expansion

(In numbers)

Items	Existing capacity	Additional capacity licensed	Total capacity licensed
Pistons	900,000	1,620,000	2,520,000
Piston Rings . . .	6,600,000	9,900,000	16,500,000
Gudgeon Pins . . .	600,000	2,010,000	2,610,000

6.1.5.2. *Units producing for self-consumption and small scale units.*—We have no information about the expansion programmes of units producing for self-consumption or the units in the small scale sector.

6.2.1. *Production.*—A statement showing unit-wise production of pistons, piston rings and gudgeon pins for the years 1963, 1964 and 1965 is given in Appendix IV. A summary would be as follows:—

TABLE 7

Production of pistons, piston rings and gudgeon pins

(In numbers)

Particulars	1963	1964	1965
Production of Pistons			
Units producing for sale . .	740,491	718,256	901,840
Units producing for self consumption.	53,145	62,775	80,125
Small scale units . . .	105,625	130,837	122,618
TOTAL .	899,261	911,868	1,104,583

Particulars	1963	1964	1965
Production of Piston Rings			
Units producing for sale . .	9,338,651	9,377,161	9,789,636
Units producing for self consumption.	nil	nil	nil
Small scale units . . .	587,825	766,820	905,542
TOTAL .	9,926,476	10,143,981	10,695,178
Production of Gudgeon Pins			
Units producing for sale . .	474,359	488,930	523,390
Small scale units . . .	98,256	114,300	160,560
TOTAL .	572,615	603,230	683,950

There has, therefore, been considerable increase in production of all the items since 1963. The production of pistons in 1965 registered a rise of 22.6 per cent over 1963 figures while that of piston rings increased by about 8.0 per cent and of gudgeon pins by 19.1 per cent during the same period. It will be seen from the above table that there has been a steady progress throughout the three years since the Commission last inquired into the industry. The highest rise has been in 1965 specially in the case of pistons of Escorts Ltd., where it was 73 per cent of 1962. The small scale sector accounted for about 10 per cent of total production of pistons and rings and more than 20 per cent of gudgeon pins.

6.2.2. *Utilisation of capacity.*—A study made by the research wing of the Commission shows that there has been considerable under-utilisation of capacity in the industry to the extent of 20 to 35 per cent in 1964 and 1965 though the position improved in respect of pistons and gudgeon pins in 1966. The main reasons are (i) inadequate and insufficient power supply, (ii) lack of continuity in the supply of raw materials, (iii) inadequacy of wagon space in goods train and (iv) in the case of some units defects in organisational efficiency and planning of production and inventories. Detailed probes would be necessary to establish the precise remedies, but since the managements of the three main producers are conscious of the problems no further remarks need be made in a report of the nature we have in hand. The industry has fortunately been free of labour troubles.

7. Domestic demand

7.1. The piston assembly consists of pistons, piston rings and gudgeon pins. The scope of the present inquiry is limited to those assemblies which are adapted for use as parts and accessories of internal combustion engines of all kinds but excluding those adapted for use in internal combustion engines of agricultural tractors and aeroplanes. The main determining factors for estimating the future demand for pistons are:—

(i) The population of vehicles using internal combustion engines and stationary industrial internal combustion engines already in use at the beginning of each year;

(ii) The targeted production of vehicles using internal combustion engines and of stationary internal combustion engines;

(iii) Rate of obsolescence of vehicles and engines in use;

(iv) Number of cylinders per engine;

(v) Useful life of a piston for each category of engine.

Item Nos. (ii) and (iv) determine the demand of pistons for original equipment while item Nos. (i) in combination with (iii) and (v) determine the replacement requirements for pistons. Demand for rings arises mainly for dressing the pistons (*i.e.*, pistons required as original equipment as well as for replacement) and for re-ringing, *i.e.*, replacement of rings without discarding the pistons. The total requirement of rings for re-ringing are estimated on an assumption based on experience that every piston is re-ringed about once during its life time. Since each piston requires a gudgeon pin the demand for pins more or less equals the demand for pistons.

सत्यमेव जयते

7.2. *Estimates of demand in* 1963 *inquiry.*—The Commission's estimates of domestic demand for pistons, piston rings and gudgeon pins for the years 1963 and 1965 are given in the following table. The demand for 1964 was taken as the median:—

(In million numbers)

	1963	1965
Pistons	1·50	2·00
Piston Rings	10·50	14·00
Gudgeon Pins	1·60	2·20

7.3. *Apparent consumption.*—As against the above estimates, the apparent consumption of pistons, piston rings and gudgeon pins (made up of production and imports) during 1963, 1964 and 1965 was as follows:—

TABLE 8

Apparent consumption of pistons, piston rings and gudgeon pins

(In numbers)

Particulars	1963	1964	1965
A. *Pistons*			
1. Production—			
(a) Units manufacturing for sale.	740,491	718,256	901.84[illegible]
(b) Units manufacturing for self-consumption.	53,145	62,775	80,92[illegible]
(c) Small scale units .	105,625	130,837	122.0[illegible]
TOTAL PRODUCTION .	899,261	911,868	1,105.[illegible]

Particulars	1963	1964	1965
2. Imports	38,883	36,750	21,350
Apparent Consumption (1+2).	938,144	948,618	1,126,733
Commission's estimates of domestic demand during 1963 inquiry.	1,500,000	1,750,000	2,000,000
B. *Piston Rings*			
1. Production—			
(a) Units manufacturing for sale.	9,338,651	9,377,161	9,789,636
(b) Small scale units .	587,825	766,820	905,542
TOTAL PRODUCTION .	9,926,476	10,143,981	10,695,178
2. Imports	214,775	108,088	146,793
Apparent Consumption (1+2).	10,141,251	10,252,069	10,841,971
Commission's estimates of domestic demand during 1963 inquiry.	10,500,000	12,250,000	14,000,000
C. *Gudgeon Pins*			
1. Production—			
(a) Units manufacturing for sale.	474,359	488,930	523,390
(b) Small scale units . .	98,256	114,300	160,560
TOTAL PPRODUCTION .	572,615	603,230	683,590
2. Imports	126,869	312,410	432,737
Apparent Consumption (1+2).	699,484	915,640	1,116,687
Commission's estimates of domestic demand during 1963 inquiry.	1,600,000	1,900,000	2,200,000

NOTE.—Besides pistons, piston rings and gudgeon pins being imported separately, complete piston assemblies were also imported to the extent of 187,355 in 1963, 14,183 in 1964 and 34,138 in 1965.

सत्यमेव जयते

The above figures indicate that the Commission's estimates of demand during the last inquiry were very much on the high side specially for pistons and gudgeon pins.

7.4.1. In connection with the present inquiry, we have received varying estimates of demand from the three producers and the D.G.T.D. These estimates are given in Table No. 9. The D.G.T.D. has based his estimates on those of the Development Council for Automobiles and Automobile Ancillary Industries. These estimates relate to the year 1965-66. In the absence of reliable information of future production programmes, which will depend on the ability of the automobile industry to replace imported components with those of suitable indigenous manufacture, our estimates can only be based on recent trends.

सत्यमेव जयते

TABLE 9

Statement showing the estimates of demand as furnished by India Pistons, Escorts, Goetze and D. G. T. D.

(In numbers)

Name of the party	PISTONS			PISTON RINGS		
	O.E.	Replacement	Total	O.E.	Replacement	Total
1960						
D.G.T.D. (for the year 1965-66)	770,000	1,445,300	2,215,300	N.F.	2,997,000	..
India Pistons Ltd.	492,000	1,199,000	1,691,000	8,502,000	6,073,000	14,575,000
Escorts Ltd.	498,000	906,400	1,404,400	..	..	..
Goeteze (India) Ltd.	..	..	..	2,026,000	4,017,200	6,043,200
1966						
Indian Pistons Ltd.	556,000	1,284,000	1,840,000	9,248,000	6,509,000	15,757,000
Escorts Ltd.	582,000	989,640	1,572,640	..	..	..
Goetze (India) Ltd.	..	..	..	2,574,000	4,389,400	6,963,400
1967						
India Pistons Ltd.	628,000	1,387,000	2,015,000	10,128,000	7,038,000	17,166,000
Escorts Ltd.	679,000	1,086,240	1,765,240	..	..	..
Goetze (India) Ltd.	..	..	..	2,716,000	4,823,060	7,539,060
1968						
India Pistons Ltd.	736,000	1,514,000	2,250,000	11,332,000	7,688,000	19,020,000
Escorts Ltd.	794,000	1,203,200	1,997,200	..	..	..
Goetze (India) Ltd.	..	..	..	3,176,000	5,349,080	8,525,080

NOTE : No estimate for gudgeon pins has been furnished.

O.E.=Original Equipment.

7.4.2. Our estimate of demand is based on the figures of vehicle population furnished by the Ministry of Transport and Civil Aviation, the present rate of production of internal combustion engines and the assumption that the annual increase in production will be 10 per cent of the production in 1965. We have taken into account the percentages of vehicles and engines going out of use as assumed by the Jha Committee, and have provided for replacement of rings at least once in the life of a piston. The average serviceable life of a piston is taken to be 5 years for cars and jeeps, 4 years for commercial vehicles, 3 years for motor cycles and 5 years for industrial engines. We have also assumed that on an average a passenger car has 4 cylinders, a commercial vehicle 6 cylinders and motor cycles and industrial engines one cylinder each.

7.4.3. The vehicle population as on 31-3-1965 (assumed to be the population at the end of the year 1964) was as follows: —

TABLE 10

Vehicle Population as on 31-3-1965

(In numbers)

Private motor cars	332,000	332,000
Commercial vehicles :		
Goods vehicles	242,700	
Motor cabs	30,000	
Buses	71,350	
Miscellaneous vehicles	60,000	
	404,050	404,050
Jeeps	53,700	53,700
Motor cycles and	182,600	
Auto rickshaws	13,200	
	195,800	195,800
Industrial engines	370,000	370,000
		1,355,550

सत्यमेव जयते

The vehicle production (12 months November 1964 to October 1965 assumed to be production during 1965) was as follows:—

TABLE 11

Vehicle production in 1965

(In numbers)

Cars	24,849
Commercial vehicles	36,293
Jeeps	10,067
Motor cycles, scooters, mopeds and 3-wheelers .	48,969
Industrial engines	81,130
	201,308

The projected rate of production of vehicles and stationary engines based on the above information and assumptions is as follows:—

TABLE 12

Projected rate of production of vehicles and engines

(In numbers)

Items	Projected vehicles (Actual November 1964 to October 1965)	Rate of production of 1965-1968 1966	1967	1968
Cars	24,849	27,334	29,819	32,304
Commercial vehicles .	36,293	39,922	43,551	47,180
Jeeps	10,067	11,074	12,081	13,088
Motor cycles, scooters, etc.	48,969	53,866	58,763	63,660
Industrial engines . .	81,130	89,243	97,356	105,469
TOTAL .	201,308	221,439	241,570	261,701

(Rate of annual increase in production assumed to be 10 per cent of 1965 production).

7.4.4. The demand for pistons and rings in the year 1966 and 1968 is estimated to be as follows:—

TABLE 13

Estimates of demand for 1966 *and* 1968

(In million numbers)

Items	1966	1968
Pistons	1·662	1·926
Rings	14·211	16·293

We have assumed that the demand for gudgeon pins will be 10 per cent more than the demand for pistons. Thus the demand for gudgeon pins will be as follows:—

TABLE 14

Estimates of demand for gudgeon pins

(In million numbers)

	1966	1968
Gudgeon pins	1·828	2·119

Details of our estimates of demand for pistons and piston rings are given in Tables, 15, 16 and 17.

7.4.5. Our estimates for pistons, piston rings and gudgeon pins in 1966 appear to be considerably more than the apparent consumption shown in Table 8, but keeping in mind the fact that availability figures are not complete and during the discussions it was pointed out that there is an acute shortage of piston rings and pistons, they are reasonable. Some small scale producers had difficulty in selling their pistons because they depended on large scale producers for their requirement of piston rings which are now in short supply. The representatives of public sector undertakings present at the inquiry also stressed the difficulty of obtaining pistons and piston rings.

TABLE 15

Estimate of demand for pistons

(In '000 numbers)

Items	1966			1968		
	OE	Re-placement	Total	OE	Re-placement	Total
Cars and jeeps .	154	326	480	182	369	551
Commercial vehicles.	240	633	873	283	700	983
Motor cycles, scooters and 3-wheelers.	54	79	133	64	108	172
Industrial engines	89	87	176	105	115	220
			1,662			1,926

TABLE 16

Estimate of demand for Rings during 1966

सत्यमेव जयते

(In '000 numbers)

Items	No. of rings per piston	Piston demand			Dressing rings	Re-ringing	Total For piston rings
		O.E.	Re-placement	Total			
Cars and jeeps .	4	154	326	480	1,920	1,304	3,224
Commercial vehicles . .	6	240	633	873	5,238	3,798	9,036
Motor cycles, scooters and 3-wheelers .	3	54	79	133	399	237	636
Industrial engines . .	5	89	87	176	880	435	1,315
							14,211

TABLE 17

Estimate of demand for Rings during 1968

(In '000 numbers)

Items	Piston demands		Total	Dressing rings	Re-ringing	Total for piston rings
	O.E.	Replacement				
Cars and jeeps .	182	369	551	2,204	1,476	3,680
Commercial vehicles . .	283	700	983	5,898	4,200	10,098
Motor cycles, scooters and 3-wheelers .	64	108	172	516	324	840
Industrial engines. . .	105	115	220	1,100	575	1,675
						16,293

7.4.6. By the end of 1968, therefore, the industry should be able to take care of internal demand for pistons and have a surplus for export. The surplus should be substantial if Shama Pistons and Rings Ltd. is also able to set up significant production by then as it now anticipates.

8. Raw materials

8.1. The principal raw materials required by the piston assembly manufacturers are aluminium alloy ingots, pig iron, special alloy steel, laminated ring steel strips, duaflex steel strips, circlip steel, pure copper, magnesium, silicon, nickel and phosphorous. Aluminium alloy is required for pistons, special steel for gudgeon pins and expander rings, and pig iron and ferro-alloys for piston rings. Data relating to the items actually purchased by the producers together with the unit value, total value, as also the percentage value of indigenous material to total value of raw material purchased for the years 1963, 1964 and 1965 are given in Appendix V.

8.2. *Castings and forgings.*—Piston bodies are made either by sand casting or gravity die casting or by hot forging billets. The installed capacities of the units for castings and forgings at the time of last inquiry and at present are indicated in table below:

TABLE 18

Installed capacities for aluminium castings and forgings

(In numbers)

Unit	Aluminium castings		Forgings	
	At the time of last inquiryin 1963	At present	At the time of last inquiry in 1963	At present
1. India Pistons Ltd.	600,000 (double shift)	N.A. The unit has launched second expansion with a capacity of 2,400,000 castings per year.	150,000 (double shift)	150,000 (double shit)
2. Escorts Ltd.	360,000 (double shift)	360,000 (double) shift)	240,000 double shift)	240,000 (double shift)

सत्यमेव जयते

8.3. The production figures for aluminium castings and forgings as furnished by the units for the last three years are given in the following table.

TABLE 19

Production of castings and forgings

(In numbers)

Unit	Aluminium castings			Forgings		
	1963	1964	1965	1963	1964	1965
India Pistons Ltd. . .	477,725	661,090	728,368	29,098*	22,386*	44,349*
Escorts Ltd.	190,305	145,770	194,373@	121,518	202,248	182,820@

*The unit has informed us that the full capacity of the forging press will be utilised whch it increases its machining capacity under its second expansion during June-July 1966.

@1965 figures are for January-November.

8.4. India Pistons has launched its second expansion for capacity of 2,400,000 castings per year and this will take care of its internal requirement of castings for manufacture of piston assemblies and also exports to U.K. under its barter arrangements for supply of machinery for its expansion. The Company's foundry expansion is now complete and its initial impact is expected to be felt during February-March, 1966. Its forging capacity will be fully utilised when it increases its machining capacity during June-July 1966.

8.5. The installed capacity of Escorts Ltd. for castings and forgings is sufficient to meet present requirements and adequate addition of equipment has been envisaged in its expansion programme for taking care of its enhanced needs of castings and forgings.

8.6. It will be seen that while some of the raw materials like copper and nickel will have to be imported in the foreseeable future, pig iron of the required grade and aluminium alloy could also be produced in the country. We are informed that the National Metallurgical Laboratory, Jamshedpur has set up a pilot plant for manufacturing magnesium metal. The research work done at the National Metallurgical Laboratory for producing magnesium should be fully exploited to reduce our dependence on imports for this metal and research should be conducted to develop a process for manufacturing silicon for which the basic raw material is available in the country. We are informed that steel suitable for gudgeon pins is on the manufacturing programme of Mysore Iron and Steel Ltd.

Bhadravati.—Whether imported hypereutectic extruded bars are an indispensable raw material for Tata Mercedes-Benz pistons needs careful examination. We are informed that equally good results can be obtained by forging cast billets of hypereutectic alloy made indigenously. Overall, less than 10 per cent of the raw materials in value would need to be imported if the problems of substitution are carefully and imaginatively tackled. The basic raw materials which India Pistons need to import are alloy steel bars and strips which account at present for foreign exchange of Rs. 6/7 lakhs per annum, and may go up to Rs. 12/13 lakhs by the end of 1968. The Mysore Iron and Steel Works, Bhadravati and the Durgapur Alloy Steel Plant who will shortly undertake manufacture of special alloy steels, should endeavour to include the requirements of India Pistons in their programmes. Hypereutectic aluminium alloy again should be within the production capacity of the main aluminium producers. It accounts for about Rs. 30/40 lakhs of imports, and there is a special problem in respect of extrusion of rods which account for most of the import. The matter needs investigation by the D.G.T.D. With the production of these two items within the country the imports will comprise elemental metal and small quantities of ferro-silicon (75-90%), ferro phosphorous (25%) and ferro-chrome (72%) the total value of which would be of the order of Rs. 1/2 lakhs and may not go beyond Rs. 3/4 lakhs even after expansion plans are complete.

9. Cost of virgin aluminium

9.1. Somewhere between 15 and 35 per cent of the cost of a piston is represented by the cost of aluminium used in its manufacture, and consequently, the price of aluminium is an important element in the build-up of the ex-works price of a piston. India Pistons has represented to us that the reduction of aluminium prices to world levels will improve the competitive capacity of the industry significantly and may even open up a large export market.

सत्यमेव जयते

9.2. Aluminium is an essential raw material for a number of industries besides pistons and its consumption has increased very rapidly in this country since 1951. Its lightness, rigidity, conductivity, tensile strength, etc. have assisted in reducing dependence on many non-ferrous metals of which the country is short like copper, lead and zinc. With a Fourth Plan production target of 260,000 tonnes (installed capacity 273,000 tonnes) a careful watch over aluminium prices is of prime importance to our economy.

9.3. Wholesale prices of aluminium fell from Rs. 3232 per ton in early 1952 to Rs. 2885 in 1955 and rose subsequently to Rs. 3729 in 1958. Prices then fell to Rs. 3228 in 1961 to rise again gradually to Rs. 3395 at the end of 1964. In our Report on the Aluminium industry in 1964 we estimated the future ex-works price (exclusive of duty and distribution charges) of the Indian Aluminium Company at Rs. 2910 per tonne. This included a fair return on employed capital and a small cushion for unforeseen increases in the elements of cost. The similar estimate for Hindustan Aluminium Corporation was Rs. 3425. As against these estimated prices the prices actually charged increased rapidly during 1965/66 as follows :—

TABLE 20

Prices of aluminium ingots

(In Rs. per tonne)

Period	Madras Aluminium Co.	Indian Aluminium Co.	Aluminium Corporation of India	Hindustan Aluminium Corporation
September, 1964 . .	Not in production.	3,290	3,290	3,550
January, 1965 . .	..	3,290	3,290	3,550
July, 1965 . . .	3,608	3,290	3,500	3,550
December, 1965 . .	4,116	3,490	3,500	3,950
January, 1966 . .	4,291	3,490	3,500	3,950

The prices of imported and indigenous aluminium alloy LM 13 are made up as follows:—

TABLE 21

Prices of aluminium alloy

(In Rs. per tonne)

Items	Imported	Indigenous
C. I. F. or ex-factory	2,520 (CIF)	5,340 (ex-factory)
Import duty	1,760	..
Excise duty	360	360
TOTAL .	4,640	5,700

In other words, this important raw material is available to the Indian manufacturer at Rs. 5,700 per tonne against somewhere below say, Rs. 2,400 to his foreign competitor.

In the case of the small scale producer the price has been as high as Rs. 6750 per tonne. Clearly, this position is unsatisfactory in the case of a raw material for which the basic ore, and other requisites like power are fully available in the country.

9.4. Reduction of the cost of production of aluminium and a check on the producer's profit are much to be desired. The former would need a careful study of each element of cost from mining and reduction of ore to transport charges and electricity rates. Due attention would also have to be paid to the location and size of future units of the industry, and the expansion of existing units to their optimum sizes. The downward trends in prices during 1952/55 and 1958/61 were probably due in a large measure to expansion of production, and the increases in between, and after due to rises in conversion costs of ore and alumina. However, despite a large increase in production between 1961 (18,270 tonnes) and 1963 (54,966 tonnes) prices remained stationary or even went up slightly during this period. We have not made any detailed investigation of the reasons for this which would take us beyond the scope of the present inquiry. Our estimates of 1964 suggest that the increases between 1963 and 1965 are not justified, at least, not fully. Some interesting points arise out of our estimates of 1964. A variation of one paisa per KWH of electricity for example means a variation of Rs. 200 per ton of metal. So also as evidence of the bearing of transport costs we would point out that the transport of alumina from Muri to Alupuram accounts for something like Rs. 400 in the final price of the metal ex-Alupuram. We would therefore reiterate the need for a national policy in regard to this important metal, which with steel, would affect the competitive capacity of many Indian industries.

10.1. *Standards:*

10. Standards and quality.

10.1.1. At the time of last inquiry in 1963 the Indian Standards Institution had informed us that a draft I.S.S. for piston rings covering piston rings for automotive purposes upto 200 mm. diameter including chromium plated rings had been revised and it was to be discussed further. The draft on gudgeon pins was in a preliminary stage and draft on cast iron and aluminium alloy pistons were on the Institution's programme of work but the standardisation of piston assemblies was not likely to be taken up. The I.S.I. has now informed us that the work on items is still continuing. The Institution has also stated that an amount of re-modification of the draft became necessary as an attempt was being made by it to rationalize the cylinder bore sizes for internal combustion engines. The draft Indian Standard Cylinder Bore Diameters for Internal Combustion Engines, DOC: EDC 14 (797) is being revised taking into consideration not only the recommended bore sizes for future designs but also such of the existing sizes as are inescapable and have to be included. The I.S.I. proposes to publish the standards on piston rings, cylinder liners and piston assembly etc. as soon as this draft is finalised.

10.1.2. The I.S.I. has requested that the Commission, while formulating its recommendation, may ensure that all future designs should be on the basis of first preference sizes given in the draft Indian Standard Cylinder Bore Diameters for Internal Combustion Engines, DOC:EDC 14 (797). The relevant first preference sizes as mentioned in the draft are reproduced below:

First preference sizes for Cylinder Bore Diameters of Internal Combustion Engines as contained in the Draft Indian Standard Cylinder Bore Diameters for Internal Combustion Engines

(Dimensions in millimeters)

Preferred	Preferred	Preferred	Preferred	Remarks
30	70	120	170	*These diameters are already in use.
32	71	125	175*	
35	72	130	180	
36	75	135	185	
40*	80*	140	190	
45	85*	145	195	
50	90*	150	200	
55	95*	155		
56	100*	160		
60	105			
63	112			
65	115*			

The selection of cylinder bore diameters for internal combustion engines is a matter having a direct bearing on the design and performance of engines and needs careful examination by the engine manufacturers. We suggest that engine manufacturers may give due consideration to it.

10.2. *Quality :*

10.2.1. *Views of consumers*

The following consumers including the main automobile manufacturers have found the quality of indigenous product to be satisfactory:

1. Cooper Engineering Ltd., Satara Road.
2. Acme Manufacturing Co., Bombay.
3. Calcutta State Transport Corporation, Calcutta.
4. Ashok-Leyland Ltd., Madras.
5. Tata Egnineering and Locomotive Co. Ltd., Bombay.
6. Simpson and Co. Ltd., Madras.
7. Bombay Electric Supply and Transport Undertaking, Bombay.
8. Automobile Products of India Ltd., Bombay.
9. Escorts Ltd., Faridabad.
10. The Enfield India Ltd., Madras.
11. Maharashtra State Road Transport Corporation, Bombay.
12. Standard Motor Products of India Ltd., Madras.
13. Mahindra and Mahindra Ltd., Bombay.
14. T. V. Sundaram Iyengar and Sons (Pvt.) Ltd., Madurai.

10.2.2. The D.G.T.D. has reported that generally speaking there has been no complaint from consumers, and that the Indian Institute of Science, Bangalore had tested the rings produced indigenously and found them satisfactory. Minor complaints and complaints relating to a small number of components have been received from various consumers. These relate to inaccuracy in the quality of circlips, breakages of piston ring sets, sand in combustion chamber, life of pistons, lack of uniformity and ovality, and so forth.

Our general impression is that quality has improved vastly since our last Report, and that progress in this respect is being maintained. The large export orders obtained by India Pistons from the U.K. and Eastern Europe are evidence of the maintenance of standards and quality.

10.3. *Facilities available to producers for testing the finished product.*

10.3.1. India Pistons informs us that the quality of its products is ensured by the most rigid inspection and laboratory controls from the raw material to the finished product stage with the latest equipment, and consistent with the practiced similar manufacturers all over the world. It has also stated that, as the products manufactured by it are in exact accordance with the specifications and drawings as submitted by the original equipment manufacturers or by its associates for replacement types for proved designs—it should be satisfactory in performance in all respects. The unit is of the view that life tests are required only for new designs developed in the country, for which adequate facilities are being made available in its factory, apart from such facilities at the Indian Institute of Science, Bangalore and elsewhere. A full fledged quality control department with adequate number of qualified staff is in operation and the control measures instituted at various stages of manufacture, *i.e.*, incoming raw material control, in-process control, finished product quality control, have had a considerable impact on the quality of its end products. It has also ordered equipment for its Research and Development Unit which is expected to be in operation by late 1966. It is claimed that this would be the first ancillary manufacturer in India to have such facilities.

10.3.2. Escorts Ltd. informs us that it has a modern laboratory for testing the metallurgical properties and chemical analysis of castings, as also of finished products. At each stage of machining, the unit claims, the pistons are inspected for dimensional accuracies with special instruments and measuring devices. In the final inspection stage an array of devices specially developed by its collaborators to check dimensional accuracies is available and is made use of. The unit claims that the quality of the pistons which leave its factory is thus ensured. Final inspection reports consisting of the metallurgical properties as well as mamigraph are invariably furnished to the engine manufacturers wherein details of the comparison made with the actually observed dimensions as against the stipulated specifications are given. The unit also sends its samples periodically to its collaborators for a thorough metallurgical as well as dimensional analysis at their end.

10.3.3. Goetze (India) Ltd. has stated that it has a modern laboratory for testing the metallurgical properties as well as for chemical analysis of castings as also the finished products. Electronic "Go" and "No Go" gauges are stated to be in operation thus ensuring 100 per cent quality. Periodically it sends samples to its collaborators for a thorough metallurgical as well as dimensional analysis.

10.3.4. We have inspected the factories referred to above and are of the view that the laboratories and inspection equipment are satisfactory.

11. Import control policy and imports.

11.1. Import control policy relating to piston rings and piston assemblies is given in list III of Appendix 26 of Import Trade Control Policy Schedule. The quota for established importers during the last three licensing periods as well as the current licensing period are given below:

सत्यमेव जयते

Licensing period	Piston assemblies	Piston rings
	%	%
April 1963—March 1964	16 2/3	3 1/8
April 1964—March 1965	16 2/3	3 1/8
April 1965—March 1966	5	nil
April 1966—March 1967	5	nil

Details of the licensing policy since the licensing period April 1963-March 1964 are given below:

11.1.1. *Piston Assemblies:*

11.1.1.1. During the licensing period April 1963-March 1964 established importers were allowed a quota of 16 2/3 per cent with the proviso that not more than 40 per cent of the face value of quota licenses could be utilised for import of aluminium piston assemblies of 6″ diameter and less and within the face value restriction of 40 per cent not more than 25 per cent of this part of licence should be utilised for import of aluminimum piston assemblies (including over sizes) for models detailed in Annexure 'A' to the Appendix 26 of the Import Trade Control Policy. Applications from Government projects and State Transport Organisation for import of complete piston assemblies of vehicles against their A.U. licences were to be considered in consultation with the D. G. T. D. with the exception of those referred to in Annexure 'A' Quota licenses issued to established importers for import of spares of agricultural tractors [S. No. 74(iii)V], spare parts of motor cycles and scooters and spares of earth moving equipment [S. No. 65(5)(ii)(a)/V] could be endorsed for the import of complete piston assemblies other than those mentioned in Annexure 'A'. Such endorsements were to be made only for the specified parts indicating part number and size and the respective quantities. Such permissions were to be granted upto a value of Rs. 2500 in each case and could be extended upto Rs. 4000 in the case of established importers of spare parts of earth moving equipment.

11.1.1.2. The above policy continued to be in force during the subsequent period April 1964-March 1965 except that Annexure 'A' of Appendix 26 was removed from the policy book. In August 1964 the policy for piston assembly was amended to remove the restriction of 25 per cent from within the quota of 40 per cent to be utilised for import of aluminium piston assemblies of 6″ diameter and less (including over sizes) and in the case of piston pins and bushings which were permitted to be imported as part of complete piston assemblies were subject to the condition that not more than 5 per cent of the face value of the licences could be utilised for the import of piston pins and bushings exclusively.

11.1.1.3. During the licensing period April 1965-March 1966 the quota for established importers was reduced to 5 per cent and it was provided that not more than 60 per cent of the face value of the quota licences could be utilised for import of aluminium piston assemblies with 6″ diameter and less. (During this policy period although overall quota has been reduced the percentage utilisation for aluminium piston assemblies has been increased from 40 per cent to 60 per cent). This policy has been continued during the current licensing period also.

11.1.2. *Piston rings:*

11.1.2.1. During the licensing period April 1963-March 1964 established importers were given a quota of 3⅛ per cent for all types of piston rings of 6″ diameter used on motor vehicles with the proviso that not more than 25 per cent of the face value of the quota licences could be utilised for import of piston rings of 6″ diameter and below. Piston rings (both 6″ diameter and below and over 6″ diameter) were also allowed to be imported in the case of (a) original equipment either c.k.d. or assembled, or (b) fitted to piston when imported as complete piston assemblies. Established importers of motor cycle spares having quotas for piston rings were granted additional licences for import of this item on the basis of a quota of 5 per cent and these additional licences were, however, to be valid only for import of piston rings specially adapted for use on motor cycles and scooters. Against licences for import of spare parts for agricultural tractors and for tractor drawn agricultural implements [S. No. 74(iii)/-V] piston rings of all sizes upto Rs. 1000 in value were allowed to be imported.

11.1.2.2. The above policy was continued for the subsequent licensing period, namely, April 1964-March 1965. For the licensing period April 1965-March 1966 the quota of this item for established importers was reduced to 'nil'. The item was, however, allowed to be imported with (a) original equipment either c.k.d. or assembled, or (b) fitted to piston when imported as complete piston assemblies, or (c) against licences for Sl. No. 74(iii)/V subject to a ceiling of Rs. 1000. This policy has remained unchanged during the current licensing period.

11.2. *Imports.*—The following table shows the import of piston assemblies, pistons, piston rings and gudgeon pins during the years 1963, 1964 and 1965. Since published data regarding imports of piston assemblies and their components are not available, this information has been compiled on the basis of returns received from the Director General of Commercial Intelligence and Statistics, Calcutta.

TABLE 22

Imports of piston assemblies and their components

Name of articles	1963		1964		1965	
	Quantity Nos.	Value Rs.	Quantity Nos.	Value Rs.	Quantity Nos.	Value Rs.
1. Trunk piston assemblies of diameter 6″ (153 mm.) and below.	187,355	11,13,167	14,183	4,54,509	34,138	11,13,678
2. Trunk pistons of diameter 6″ (153 mm) and below.	38,883	5,58,408	36,750	5,53,777	21,350	12,58,488
3. Trunk Piston rings (including chromium plated rings) of diameter 6″ (153 mm) and below.	214,775	4,16,494	108,088	5,67,226	146,793	11,88,744
4. Gudgeon pins for trunk pistons of diameter 6″ (153 mm) and below.	126,869	4,14,370	312,410	7,50,273	432,737	17,03,827

It may be seen from the above table that imports of piston assemblies (in value) went down from Rs. 11.13 lakhs in

1963 to Rs. 4.55 lakhs in 1964 but again increased to Rs. 11.14 lakhs in 1965. In the case of pistons, rings and gudgeon pins the import figures in value are much higher in 1965 as compared to 1963 and 1964. Our inquiries show that the figures of quantity are not complete and that no conclusion may be drawn safely regarding average value.

12. Exports.

12.1. Exports are not recorded separately in the published Monthly Statistics of the Foreign Trade of India. The producers have, however, reported export of their products during 1963, 1964 and 1965 the details of which are reproduced below :—

TABLE 23

Exports of pistons and piston rings

Items	1963		1964		1965	
	Quantity Nos.	Value Rs.	Quantity Nos.	Value Rs.	Quantity Nos.	Value Rs.
India Pistons Ltd., Madras.						
Pistons . .	962	10,982	2,838	37,522	1,142	21,740
Piston rings .	..	..	150,120	83,772	6,21,170	3,75,644
Ring sets . .	259	6,266	..	..	2,468	8,085
Escorts Ltd.						
Not furnished	..	..	80	2,610	22	720

NOTE.—In addition, India Pistons has on hand an order for pistons worth about Rs. 60 lakhs for export to its collaborators to be executed over the next seven years in barter for plant and equipment for its expansion. The prices are equivalent to those of their competitors as delivered at the premises of Associated Engineering Ltd. and said to be roughtly 20 per cent below Indian prices on an ex-works basis.

12.2. The producers were specifically asked whether their foreign collaborators had permitted them to exercise their export rights with the use of their trade marks. In that connection India Pistons has informed us that the technical aid agreement with its collaborators, vests it with world export rights, but restricts use of their trade mark. Escorts Ltd., has stated that there is no restriction to export under its own name. Goetze (India) Ltd. has referred to the relevant clause in its agreement with its foreign collaborators which is reproduced below:—

> "The exports of products will be freely permitted. In case the German Company acts as an agent of the Indian Company for its exports, the German Co. would be given such commission as may be allowed by the Reserve Bank of India from time to time. The Indian Company will also be entitled to same commission if the German firm exports its products to territories for which the Exports Rights have been granted to the Indian Company, such as India, Nepal, Ceylon, Burma, Malaysia and Indonesia."

12.3. The prospects of exports of piston assembly and its components would appear to be promising, particularly as regards Eastern European markets, as seen from the performance of India Pistons, provided costs of aluminium are kept down and a high rate of production maintained.

Existing rates of duty.

13. The protected items of piston assemblies and components thereof are assessed to duty under item No. 75(12A) of the First Schedule to the Indian Tariff Act, 1934. The current rates of duty are as under:

TABLE 24

Existing rates of duty

Item No.	Name of article	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of			Duration of protective rate of duty
				The U.K.	A British colony	Burma	
1	2	3	4	5	6	7	8
75(12A)	The following articles adapted for use as parts and accessories of internal combustion engines of all kinds but excluding such articles as are adapted for use						

TABLE 24—*(Contd.)*

1	2	3	4	5	6	7	8
	exclusively as parts and accessories of internal combustion engines of agricultural tractors and aeroplanes, namely :—						
	Trunk piston assemblies of diameter 153 millimeters and below, trunk pistons of diameter 153 millimetres and below, trunk piston rings (including chromium plated rings) of diameter 153 millimeteres and below and gudgeon pins for trunk pistons of diameter 153 millimetres and below.*	Protective	60% *ad valorem*	..	..	..	December 31st 1966.

सत्यमेव जयते

(*These are GATT items)

NOTES.—(1) Under Government of India, Ministry of Finance, (Revenue Division), Notification No. 198-Customs, dated the 24th December, 1955, as subsequently amended by Ministry of Finance (Department of Revenue), Notification No. 131-Customs, dated the 20th August, 1965 articles falling under this item, if of the United Kingdom manufacture, are exempt from the payment of so much of that portion of the customs duty leviable thereon which is specified in the First Schedule to the Indian Tariff Act, 1934, as is in excess of 52 1/2 per cent *ad valorem*.

Provided that the said articles are adapted for use exclusively as parts and accessories of motor vehicles other than motor cars including taxi cabs.

(2) A regulatory duty of 10 per cent *ad valorem* is also leviable on the above items.

(3) The standard rate of duty was raised from 50 per cent to 60 per cent *ad valorem* under the Finance Act No. 2 of 1965.

14. Cost of production and fair ex-work prices.

14.1.1. As stated earlier in paragraph 2.2. the three companies, namely, the India Pistons Ltd., the Goetze (India) Ltd., and the Escorts Ltd. whose costs were examined in the last enquiry were selected this time also for cost examination. The reports of our Cost Accounts Officers being confidential are sent to Government separately as enclosures.

14.2. In the case of the India Pistons Ltd. the costs were examined for the audited period of 1964-65 and for half-yearly audited accounts ending on 30th September 1965. The Company maintains a costing system and has recently introduced a system of standard costing and budgetary control to a limited extent. The costs were computed on the basis of their existing system with necessary modifications wherever considered necessary. Their present system leaves room for further improvement which they desire to carry out after the installation of a proposed mechanised system of accounting. The Company has become self-sufficient in the manufacture of all the components of the piston assemblies excepting certain varieties of circlips which are purchased from outside. The Forge press has gone into production since the last inquiry and the production for Mercedes-Benz piston forgings is progressively increasing. They have not yet produced forgings from hypereutecticalloy of aluminium. The T. M. B. forgings so far manufactured were for replacement and of aluminium of L. M. E. specification. They have two foundries, one for the production of iron castings and the other for aluminium castings. Iron is melted both in a cupola and in an electric furnace, the latter furnace having the advantage of melting swarf and borings with very low melting loss. The rings used in the assemblies of pistons are manufactured mostly from centrifugally cast ring pots. Singly cast rings are used only for a limited range of pistons. The rejections in all categories of rings have become higher than what we assumed for estimates in our previous inquiry. Although higher standards of inspection and lack of uniformity in the quality of pig iron were contributory causes of higher rejections to some extent, we feel that some action could be taken by the company to reduce rejections. In regard to the duaflex rings the consumption of materials for the first cut blanks was much higher than their own standards. Here also lies a great scope for economy in the consumption of imported steel strips. In regard to the piston castings the company used some quantity of imported aluminimum ingots during 1965-66. The rejection of piston castings during 1965-66 became, by and large, lower than in 1964-65. On an average the rejection is lower than that of Escorts Ltd. In our last inquiry the production of this unit was adopted at 0.6 million pistons, 0.6 million gudgeon pins and 7.9 million rings comprising 6.3 million conventional rings, 0.3 million vacrom rings and 1.3 million duaflex rings. During the costed periods, the factory worked two shifts with 45 hours per week. The actual production during 1964-65 was 0.481 million pistons, 0.493 million gudgeon pins and 5.473 million rings out of which 4.204 millions were conventional, 0.293 million vacrom and 0.976 million duaflex rings. During the six months of 1965-66 the production came to be 0.270 million pistons, 0.265 million gudgeon pins and 2.733 million rings which included 2.087 millions conventional, 0.215 million vacrom and 0.431 million duaflex rings. During the latter period the rate of production of the conventional rings and duaflex rings decreased slightly but the production of the other components increased. The piston assemblies of sizeable production were adopted for costing. The selected items represented 89 per cent of the total production. The manufacturing costs of pistons during 1965-66 became by and large lower than in 1964-65 partly due to increased production and partly due to lower manufacturing time. Since our last inquiry, the Company has embarked upon its initial expansion scheme, the first phase of which is likely to be completed by 1966. The second phase of expansion will be taken up after the successful completion of the first one. Even if the first phase of expansion is completed according to its expectation, it expects to face certain teething troubles at the second stage and some more time would be needed to stabilise production to the level of the installed capacity in the expanded section of the plant. With more up-to-date machines and a new layout in the expanded section of the manufacturing divisions, particularly in the foundries, there will be some economy in manufacturing expenses which is likely to reduce costs, but this economy will be largely offset by the element of depreciation of the new machinery. To what extent marginal economy will be achieved will be known when the production is stabilised in the expanded sections. As the company is unable to indicate the likely economy due to various uncertainties, estimates were framed by us on the basis of the existing installed capacity with the latest pattern of productmix. The production of piston assemblies has been adopted at 0.54 million pieces which accounts for 90 per cent of the installed capacity. The production of rings and gudgeon pins has been adopted at 5.506 million pieces and 0.54 million pieces respectively. The consumption of materials, power and fuel, the percentages of rejections, the manufacturing time etc. have been adopted at more or less the same levels as for the latest costed period except that in cases where the rejections during that period were considered very high lower norms have been adopted. The latest rates of raw materials wherever available have been adopted. In the case of imported materials where there have not been recent imports, the rates of previous imports have been adopted and these have been adjusted for the latest levies of the import and excise duty. In regard to aluminium alloy the latest rate of procurement for indigenous source has been applied. Reasonable provision has been made for the probable rise in the prices of consumable, repairs and maintenance stores and packing materials. Normal increments have been provided for salaries and wages and the latest rates of D. A. have been adopted. Depreciation has been calculated at the income-tax rates with extra shift allowances wherever admissible. The expanded production after the completion of the first phase of expansion will result in some economy in the establishment and overhead charges. Reasonable decreases in the incidence under these items have been assumed.

14.1.3. Goetze (India) Ltd. which is a subsidiary of Escorts Ltd. has considerably increased the production of piston rings and liners since the last inquiry. The Company is pursuing its expansion programme to double its capacity by the end of 1966 in accordance with the licence obtained by it in 1963. The unaudited accounts for the first nine months of 1965 were adopted for cost examination so that the recent trend of expenses in the context of increased volumes of output may be reflected in the cost. In our last inquiry we recommended that the economic size of the units engaged in the manufacture of piston assemblies and their components plays an important role in the reduction of costs and so while such units launch upon increasing their production capacities they should institute a proper system of cost accounting to measure their technical and financial progress. We regret to observe that this unit although it is expanding in size has not yet taken any steps to introduce a costing system. Our Cost Accounts Officer had therefore to develop costs in consultation with the technical officials of the company on the basis of such data as were available. It may be remarked here that due to the absence of any cost accounting system a considerable portion of expenses under power, labour, stores etc. which could not be directly indentified with the cost centres had to be absorbed in the product costs as general charges on some suitable basis. Due to this it was difficult for us to make a critical examination of the cost structure. The factory worked more than two shifts in most of the departments and the production of rings during the nine months was 3.473 million pieces which included 0.50 million chrome plated rings and 0.266 million coated rings. Overall, the actual cost of production has decreased below what we estimated before. Popular varieties of rings were selected for costing and the costed items represented 76 per cent of the total production. The costs were discussed with the company and we framed our estimates for projected volumes of production which include production after expansion. The average production per annum was adopted at 5.85 million pieces on the basis of three shifts working. A small decrease in melting loss was adopted assuming increased efficiency in the foundry and the actual rejections during the costed period were adjusted marginally wherever considered necessary while determining material costs for the future. The consumption of materials was evaluated on the basis of the latest rates. To cope with the extra production the company will need a General Manager and certain other engineers. The salaries of such officials together with other additional staff were taken into consideration. Additional labour complement for the increased volume of production was admitted. Care was taken to take into cost the normal increments of salaries and wages, the latest rates of D.A., the rise in the electricity tariff and the probable increase in the prices of consumable and maintenance stores. Depreciation was calculated at the income-tax rates with allowances for extra shift working. The depreciation for plant and machinery under expansion scheme worth Rs. 55.00 lakhs was absorbed in cost. Increase in the items of overheads was provided where considered reasonable. The estimates of costs have increased inspite of the substantial increase in production. The higher depreciation on new machinery, increase in power tariff, and the remuneration of the additional staff account for the major portion of the cost increase. While submitting the requirement of the extra personnel the company represented that they were not in a position to impair quality for the sake of cost reduction. Although we admitted the company's claim for additional staff we would reiterate our view that cost reduction is always possible without sacrificing quality provided suitable measures are adopted to match quality control with cost control through a proper cost accounting system and budgetary control. We therefore, recommend that Goetze (India) Ltd. and Escorts Ltd. should take early steps in this direction.

14.1.4. Escorts Ltd. the holding company of the Goetze (India) Ltd. also do not maintain any system of costing. In this case also the costs were developed in consultation with the company's officials on the basis of available data. In absorbing expenses which could not be identified with the production centres a method similar to that followed in the case of Goetze (India) Ltd. was adopted. Our views in regard to costing for Goetze (India) Ltd. hold good in this case also. The unaudited accounts for the first nine months of 1965 were made the basis for cost examination. The production of piston assemblies during the costed period was 0.276 million pieces, which come to be 0.370 million pieces for the whole year against the installed capacity of 0.300 million. Extra production was obtained by working some departments on third shfft. Certain popular piston assemblies which represented 86 per cent of the total production were selected for ascertainment of costs. The actual costs were discussed with representatives of the company and the estimates of costs were formed by us in the light of actual costs. In our estimates the production of piston assemblies was taken at 0.567 million pieces per annum. This company at present manufactures pistons from their own aluminium castings. Three different alloys known as Mahle alloys have been developed by the company for different types of piston castings. A forge plant has also been set up for the manufacture of T.M.B. pistons and for this purpose extruded alloy rods are imported. The rejections during the costed period were higher than those we observed in the previous enquiry and higher than the rejections of India Pistons in respect of similar items. Consumption of raw materials and the rejections have been kept at the same levels as for the costed period with suitable adjustments where considered necessary. The latest procurement rates of raw materials have been adopted in the determination of their cost. The unit's entire requirement of piston rings is supplied by its subsidiary at certain rates below those charged by it for sales to other parties. These concessional rates were observed to be far higher than the production cost of the subsidiary. We considered that the adoption of the subsidiary's rates in the cost of piston assemblies will not be fair as it would load the subsidiary's profit, which is higher than the fair return determined by us for the industry, on the protected and products of the holding company. We therefore adopted the fair selling prices of rings determined by us for Goetze in our cost computation of the piston assemblies. This company expects to start the manufacture of gudgeon pins very shortly but we considered that no realistic estimate for this item could be prepared unless cost data become available after the commencement of manufacture. This item has, therefore, been priced with the latest rate of import. Labour and salary have been estimated after taking into account the required complement of additional personnel for the increased volume of production. Increase in conversion charges on account of normal increments, enhancement of electricity tariffs, and probable rise in the prices of store have been admitted in cost. Depreciation at income-tax rates inclusive of the allowance of extra shift working has been calculated for the existing plant plus expansion plant worth Rs. 69.00 lakhs. A suitable increase has been made in the items of overheads.

14.1.5. While determining the fair ex-factory prices in respect of the three costed units we have provided a margin for contingency at 2 per cent over and above the cost of production to enable the manufacturers to meet unforeseen expenses beyond their control. The engineering fees or royalties have been included in the costs in accordance with the terms of agreements existing between the costed units and their respective foreign collaborators.

14.2. A return has been provided at 15 per cent on the capital employed for all the units and the working capital component in the capital employed has been provided for at 3.5 months' cost of production excluding depreciation. In doing so we have taken into account the recent increase in corporation tax.

14.3. *Fair ex-works prices.*—The fair ex-factory prices determined by us in respect of the three units have been indicated below. It may be mentioned in this connection that the prices worked out by us are for the limited purpose of determining the extent of cost disadvantages suffered by the indigenous industry in relation to the c.i.f. prices of imported products. These prices therefore should not be construed as the fair selling prices of the producers. The selling prices of the manufacturers would include *inter alia* selling expenses, distributors' discounts etc. which have not been included in our estimates of costs. According to the expressed wishes of the producers the ex-factory selling prices have been shown against assumed names to avoid disclosure of their respective costs.

TABLE 25

Fair Ex-factory prices of pistons

	Type	Bore diameter	Producer	Estimated production	Fair ex-factory price per each Rs.
1	2	3	4	5	6
1.	Perkins . .	3·501"	(i) Producer A	1,93,220	22·211
		Do.	(ii) Producer B	76,500	28·449
			(iii) Weighted Average		23·980
2.	Leyland .	3·961"	Producer A 18	37,470	38·493
3.	(a) Fiat (with ring).	68·0 mm.	(i) Producer A	9,460	14·067
			(ii) Producer B	25,600	17·868
			(iii) Weighted Average		16·842
	(b) Fiat 1100 (without ring).	68·0	Producer A	6,780	13·427

TABLE 25—(*Contd.*)

1	2	3	4	5	6
4.	Willys' Jeep .	3 1/8″	Producer A	81,150	18·189
5.	Ambassador OHV	2 7/8″	(i) Producer A	2,320	17·785
		73·01″mm.	(ii) Producer B	4,900	20·813
			(iii) Weighted Average		19·840
6.	Petter Sr. II .	80·0mm.	(i) Producer A	22,470	22·575
		Do.	(ii) Producer B	63,800	27·323
			(iii) Weighted Average		26·086
7.	(a) Dodge .	3 7/16″	Producer A	5,280	27·174
	(b) Dodge (without ring).	3 7/17″	Producer A	13,490	17·212
8.	Standard Herald.	63·0 mm.	Producer A	25,930	14·592
9.	Standard 10 H.P.	63·0 mm.	Producer A		12·270
10.	R. E. Bullet .	2·751″	Producer A	8,710	17·911
11.	Nissan . .	85·7 mm.	Producer A	40,000	23·755
12.	Mercedes-Benz Tata Benz.	90·0 mm.	(i) Producer A	37,370	39·874
		Do.	(ii) Producer B	2,55,100	43·786
13.	Shaktiman .	100·0 mm.	Producer B	24,600	55·828
14.	Lambretta .	57·0 mm.	Producer B	21,400	13·944
15.	Vespa . .	57·0 mm.	Producer B	26,400	12·504

सत्यमेव जयते

TABLE 26

Fair Ex-factory prices of piston rings

Type	Size	Producer	Fair ex-factory price per each Rs.
1	2	3	4
1. *Perkins*			
(a) Compression . .	3/32″	(i) Producer A	0·548
	2·39 mm.	(ii) Producer B	0·588
(b) Oil	1/4″	(i) Producer A	0·981
	6·34 mm.	(ii) Producer B	0·983
(c) Maxigrove . .	1/4″	Producer A	1·027
(d) Laminated . .	1/8″	Producer A	0·633
(e) Chrome Compression	2·39 mm.	Producer B	1·221
2. *Leyland*			
(a) Compression . .	0·0781″	Producer A	1·200
(b) H. T. Compression .	0·0937″	Producer A	1·808
(c) Oil	0·2485″	Producer A	1·203
3. Fiat			
(a) Compression . .	2·50 mm.	(i) Producer A	0·533
	2·50 mm.	(ii) Producer B	0·516
(b) Oil	3·50 mm.	(i) Producer A	0·994
	3·95 mm.	(ii) Producer B	0·910
(c) Duaflex . . .	5/32″	Producer A	0·654
(d) Scrapper . . .	2·50 mm.	Producer B	0·569
4. *Willy's Jeep*			
(a) T. B. Compression .	3/32″	Producer A	0·658
(b) Oil	3/16″	Producer A	1·980
(c) Vacrom Compression	3/32″	Producer A	1·932
(d) Expander . . .	3/16″	Producer A	0·300

TABLE 26—(*Contd.*)

1	2	3	4
5. *Ambassador*			
(a) T. Compression .	0·0781″	(i) Producer A	0·534
Compression .	1·99 mm.	(ii) Producer B	0·750
(b) Oil	0·1562″	(i) Producer A	1·611
	3·97 mm.	(ii) Producer B	1·317
(c) Vacrom Compression	0·0781″	Producer A	3·303
(d) Chrome Compression	1·99 mm.	Producer B	1·517
6. *Petter Sr. II*			
(a) Compression . .	0·094″	(i) Producer A	0·527
	2·39 mm.	(ii) Producer B	0·609
(b) Oil	3/16″	(i) Producer A	1·015
	4·77 mm.	(ii) Producer B	0·885
(c) Vacrom Compression	3/32″	(i) Producer A	1·740
	2·39 mm.	(ii) Producer B	1·161
7. *Dodge*			
(a) I. S. Compression .	3/32″	Producer A	2·571
(b) Oil	5/32″	Producer A	2·584
8. *Standard (Herald)*			
(a) Compression . .	2·00 mm.	Producer A	1·209
(b) Oil	0·1562″	Producer A	1·172
(c) I.S.C. Compression .	2·00 mm.	Producer A	1·719
9. *Standard* 10. *H. P.*			
(a) Compression . .	2·00 mm.	Producer A	0·558
(b) Duaflex . . .	5/32″	Producer A	0·711
10. *R. E. Bullet*			
(a) Compression . .	1/16″	Producer A	0·690
(b) Oil	5/32″	Producer A	1·044
(c) Vacrom Compression.	1/16″	Producer A	2·446

सत्यमेव जयते

TABLE 26—(*Contd.*)

1	2	3	4
11. *Nissan*			
(a) T. Compression .	2·50 mm.	Producer A	2·474
(b) Oil	3/16″	Producer A	2·747
(c) Vacrom Compression	2·50 mm.	Producer A	3·352
12. *Mercedes-Benz*			
(a) Compression . .	3·00 mm.	(i) Producer A	0·776
		(ii) Producer B	0·801
(b) Oil	5·50 mm.	(i) Producer A	1·936
		(ii) Producer B	1·213
(c) Vacrom Compression	3·00 mm.	(i) Producer A	1·933
Chrome & Tin plated	3.00 mm.	(ii) Producer B	2.209
13 *Lambretta*			
Compression . . .	2·50 mm.	Producer B	0·709
14. *Vespa*			
Compression . . .	2·50 mm.	Producer B	0·930
15. *Shaktiman*			
(a) Chrome Compression	2·50 mm.	Producer B	1·737
(b) Compression . .	2·50 mm.	Producer B	0·808
(c) Scrapper . . .	2·50 mm.	Producer B	0·914
(d) Oils . . .	5·00 mm.	Producer B	3·040
16. *Morris*			
(a) Compression . .	2·00 mm.	Producer B	0·466
(b) Oil	3·95 mm.	Producer B	0·653
17. *Ferguson*			
(a) Chrome Compression	2·00 mm.	Producer B	1·165
(b) Compression . .	2·00 mm.	Producer B	0·491
(c) Oil	3·95 mm.	Producer B	0·777
(d) Oil	4.75 mm.	Producer B	0·872

TABLE 26—(*Contd.*)

1	2	3	4
18. ***Perkins-Chrome Filled***			
(a) Chrome Compression	2.39 mm.	Producer B	3·084
19. ***Diamler Benz-Air Compressor***			
(a) Compression	2.00 mm.	Producer B	0.434
(b) Scrapper	3.00 mm.	Producer B	0.587
(c) Oil	4·00 mm.	Producer B	0.741

Trend of costs

15. A limited study has been made on the trend of production costs based on the cost account figures for the years ended 30-9-1954, 30-9-1956, 31-3-1959 and the half year ended 30-9-1962. Since different varieties and sizes were costed on each of these occasions the study covers only two types which were costed on all the four occasions, *viz.*, the Perkins piston assembly of 3.501″ bore and the Royal Enfield piston assembly of 2.751″ bore. The study has covered trends both in respect of material economy and factory costs —the latter term including materials, power, labour, establishment, depreciation and overheads, but excluding items which are not true production costs like engineering fees and return on employed capital. The study reveals that cost of production went up continuously at an average annual rate of 9.8 per cent in the case of the Enfield assembly, the largest rise being of 43.9 per cent between 1959 and 1962. In the case of the Perkins assembly there was a slightly downward trend till 1959, but an increase of 18.6 per cent between 1959 and 1962. There were increases in all the components of cost, but the main ones were in the cost of raw materials, particularly, aluminium alloy, and of depreciation. The costs of alloy went up due to a shift from imported alloy to more expensive indigenous alloy though at the time the price of virgin aluminium produced in the country was falling. As regards depreciation the position is that while capacity and production both expanded significantly between 1954 and 1962 output was below even single shift capacity. The loading due to depreciation was particularly noticeable in

the case of the ower cost assemblies. One other fact which is of significance is that though both the main producers are large scale producers the unit with smaller capacity—half that of the larger one—had a higher production cost of nearly 70 per cent in respect of the Perkins assembly. Since 1962 there was a falling trend which however got reversed towards the end of 1965. In both units economy in the use of material was better in the earlier years but the contributory causes are now difficult to identify. No definite conclusions can be drawn from this study except that the industry reveals prospects of economies of size, and that there is a great need for careful cost accounting and for watch over each component of the costs of production.

Comparison of fair ex-works prices with c.i.f. prices and landed costs (ex-duty) of imported products.

16. We addressed the Collectors of Customs and established importers for the c.i.f. prices of the imported piston assemblies, gudgeon pins and piston rings and the information furnished by them is given in Appendix VII. Some of the manufacturers also submitted to us the c.i.f. prices of the piston assemblies marketed by their foreign collaborators. Owing to import restrictions, we received c.i.f. prices only for a limited types of products which did not cover the range of the costed items. Further, the c.i.f. prices received from different sources for similar type of products varied considerably. We, therefore, adopted those c.i.f. prices, which were considered reasonable from all points of view for the purpose of cost comparison. The comparison of cost has been limited to piston assemblies only as reliable c.i.f. prices for the components were not received by us. Such comparison is shown in the following table:—

TABLE 27

Comparison of fair ex-factory prices of indigenous products with c.i.f. prices of imported pistons

(per Piston Assembly)

Piston Type	Perkins	Fiat 1100	Willy's Jeep	Amba-ssador	Dodge 10	Standard 10	Lambretta 150 CC.	Vespa 150 CC.
Bore Diameter	3·501	68·0 mm.	3 1/8″	2 7/8″	3 7/16″	63·0 mm	57 mm	57 mm
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
(*a*) C. I. F. . . .	20·65	9·78	11·60	12·56	13·55	9·12	9·80	9·35
(*b*) Customs duty . .	12·39	5·87	6·96	7·54	8·13	5·47	5·88	5·61
(*c*) Regulatory duty . .	2·07	0·98	1·16	1·26	1·36	0·91	0·98	0·94
(*d*) Total duty (b+c) . .	14·46	6·85	8·12	8·80	9·49	6·38	6·86	6·55
(*e*) Clearing charges . .	0·52	0·24	0·29	0·31	0·34	0·23	0·25	0·23
(*f*) Landed cost (a+d+e) .	35·63	16·87	20·01	21·67	23·38	15·73	16·91	16·13
(*g*) Landed cost exclusive of duty (a+e) . . .	21·17	10·02	11·89	12·87	13·89	9·35	10·05	9·58
(*h*) Fair ex-factory price .	23·98	16·84	18·19	19·84	27·17	12·27	13·94	12·50
(*i*) Advantage of (h) over (g)	..	..	..	..	..	..	..	..
(*j*) Disadvantage of (h) compared with (g) . .	2·81	6·82	6·30	6·97	13·28	2·92	3·89	2·92
(*k*) (*j*) as % on (a) . .	13·61	69·73	54·31	55·49	98·01	32·02	39·69	31·23

It will be observed from the table above that the disadvantage to the industry varied from 13.61 per cent in case of the Perkins piston assembly to 98.01 per cent in case of Dodge piston assembly and their weighted average works out to 24.04 per cent. The weighted average is considerably lower than the disadvantages of all the items except Perkins. The Perkins assembly which represents 59 per cent of the total production of the compared items, has a disadvantage of 13.61 per cent and this has resulted in the low weighted average. The weighted average of others in the series exclusive of the Perkins assembly raises the disadvantage to 53.36 per cent. Dut to the higher production volume of Perkins one of the manufacturers has been able to keep down its cost considerably while those of other items have gone up. We consider that if due to adequate imports the lowest c.i.f. prices had been available in respect of the other costed items, the disadvantages would have been higher than 13.61 per cent and as such the weighted average would have increased beyond 24.04 per cent.

17. Selling system and selling prices.

17.1. *Selling system:*

The selling system adopted by the three main producers, as reported by them, is briefly as follows:—

17.1.1. *India Pistons:*

Their three broad channels of distribution are:—

(i) engine manufacturers,

(ii) replacement market, and

(iii) State Transport Undertakings and Government Departments.

The firm sells directly to (i) at special prices which are lower than for the replacement market and to (iii) at distributor net prices, *i.e.*, retail prices less trade discount and applicable quantity discount. As regards (ii), the firm has 10 distributors, three each in Bombay and Delhi, one each in Calcutta and Goa and two in Madras and each one has an allotted territory. The distributors get a trade discount of 20 per cent on retail prices and further get quantity and bonus discounts, the latter of which is based on certain sales targets being reached.

सत्यमेव जयते

17.1.2. *Escorts Ltd.*—Sells directly to manufacturers of engines and distributors who get both sales discounts and an additional discount for reaching sales targets. As regards Goetze (India) Ltd., all their products are sold either direct to engine manufacturers or for replacement use through Escorts.

17.1.3. There has been no serious criticism of the selling system. Complaints have taken two aspects (i) that stocks of certain types and varieties frequently run out and orders are not executed for long periods of time even in the case of public utility concerns who have placed firm orders and (ii) that parts which are not available with authorised dealers can always be obtained at higher prices (sometimes as high as thrice the list prices) from other dealers who have stocks. As regards the first criticism, the difficulty, in so far as we can judge, is on account of the inadequacy of manufacture and shortage of imports. With the expansion programmes in hand it should disappear over the next year or two. We do, however, think that as regards the second line of criticism, manufacturers should endeavour to prevent the cornering of stocks of short supply commodities by speculative dealers and for that reason supplies should be made directly to all large consumers as in the case of the State Transport organisations, who can place sizeable orders and also plan their requirements in advance. This feature of the market is common to other commodities in short supply like caustic soda, soda ash, antimony and so forth. It would be desirable for Government to arrange through the D.G.T.D. that manufacturers supply direct to all big consumers, (even if a commission has to be paid to an authorised dealer on these supplies) so that supplies made to authorised dealers do not become a source of profiteering and of large margins made merely by cornering goods while rendering no service of any sort. We would also recommend that when a manufacturer cannot supply a public utility concern with its requirements within say, six months, necessary import licences should be issued to cover its reasonable requirements.

17.1.4. India Pistons maintains a full fledged service department with a qualified service manager who attends to all complaints. Technical advice is given on any engine problem. Technical literature is made available to the engine re-conditioning trade. Special tools and equipment have been designed, made and are supplied. A well organised and equipped service centre, which we visited, is also maintained to give specialised training to motor mechanics. We have been favourably impressed with the after-sales service of this firm. Escorts and Goetze have a service department under a qualified technical manager who periodically visits engine manufacturers, large fleet owners, etc., to help solve all individual problems.

17.2. *Selling prices:*

In its last Report the Commission had recommended that the producers of piston assembly should follow the example of some other protected industries which have effected periodical reduction in their selling prices. The action taken by the industry to implement this recommendation is indicated in paragraph 4.8. Our examination of the price data as furnished by the manufacturers and consumers as well as the cost data compiled by our Cost Accounts Officers reveals that in the case of certain popular varieties of piston assembly the selling prices charged by the manufacturers include an unduly large margin of profit. The prices for replacement parts are in consequence considerably higher than the prices of parts supplied as original equipment. There is scope for reduction in the selling prices of authorised dealers. We therefore recommend that the manufacturers of piston assembly and its components should examine their pricing policy and make suitable reductions in their selling prices, wherever possible.

18. Views on protection

18.1. Opinions of the three main producers were requested on the question of continuance of protection. India Pistons has stated, that taking into consideration the significant progress achieved by the industry in developing self-sufficiency, safeguarding the consumers' interest and maintaining the price and quality levels, the industry should now be able to meet the challenge of competition without any further protection. Should the principal raw materials be made available to them at world prices this firm appears to be confident of not only reducing the prices of its products to nearer world price levels but also of making a significant impact on the export market. Escorts Ltd. and Goetze (India) Ltd., have stated that with the present foreign exchange shortage and existing levels of import duties, protection is not necessary any longer. The D.G.T.D. has not expressed any opinion. The State Government and principal consumers have expressed various views on the continuance of protection, some one way and some, the other. Amongst the prospective producers, Shama Pistons and Rings Ltd., which expects to go into production early in 1967, desires that protection should be continued at least till 1969.

18.2. In the case of a number of protected industries whose cases were reviewed by the Commission during 1964 and 1965, the Government of India have taken the view that "having regard to the fact that there is no likelihood of any unhealthy competition from imports", and "having regard to the progress the industry has made so far, tariff protection is no longer necessary". It is not clear from the orders of Government in these cases whether they have taken into account certain other consequences of protection besides the ability of the indigenous industry concerned to continue to operate profitably. Once an industry is protected a duty is cast on the Commission to watch the effects of protection both on the industry and on the consumer. Under Section 15 of the Tariff Commission Act, 1951, the Commission has to keep a watch on the progress of the industry particularly, the cost of production, scales of output, quality of the commodity, selling prices and so forth. During this period the industry has to submit periodical returns of prices, production etc. to the Commission. Also whilst a protective duty could be varied by notification after consultation with the Commission so as to maintain it at effective levels Government do not have such power to raise a revenue duty. For all these reasons the Commission is of the view that a revenue duty cannot take the place of protective duty even if the revenue duty imposed is at a high level, and therefore, protection should be continued in the interests of the consumer despite the fact that the present import restrictions and foreign exchange difficulties make the issue academic so far as the producer is concerned.

18.3. The table of comparison given in paragraph 16 shows that the indigenous industry is still under a disadvantage as compared with its foreign competitors and would therefore need protection for a further period. During the open inquiry the representatives of the manufacturers admitted that if imports of piston assembly and its components were liberally allowed by Government, they would not be able to face competition without protection. Although the weighted average of the disadvantage to the industry works out to about 24 per cent, we are not in favour of reducing the existing rate of duty as the benefit of such reduction is not likely, in our view, to be passed on to the consumer by the importer. It will be observed from paragraph 6.1.5 that there will be substantial expansion in capacity and production of the industry during the next three years inclusive of that of a new large scale unit. With the prospective increase in the volume of production the cost of manufacture should go down. In view of these and other considerations mentioned above we recommend that protection to the piston assembly and its components covered by I.C.T. item No. 75(12A) should be continued for a period of three years ending 31st December 1969 at the existing rates of duty. We wish to emphasize that our recommendation to continue protection at a rate of duty considerably higher than that indicated by the price comparison is to secure orderly development of the industry when additional capacity and a new unit are coming into existence, and should not be construed by the industry as approval of increase in selling prices. On the other hand we would reiterate the responsibility of the industry to take early action to implement our recommendation made in paragraph 17.2 that it examine its pricing policy and effect reductions in selling prices, which are clearly possible in respect of sales through dealers for purposes of replacement.

9. Ancillary recommendations

19.1. We have in course of the Report made several ancillary recommendations including one of importance like a price policy for aluminium.

19.2. India Pistons has urged that no further units should be licensed during the Fourth Plan period without giving existing units opportunities to expand further and secure the benefits of mass production. In our remarks on capacity and demand earlier in this report we have come to the view that the existing and prospective units of the industry should on two shifts working be able to meet all internal demands and have a surplus for export. The small scale industry should in its turn be able to take care of small demands as also of obsolete and obsolescent types which may not interest the large producers. We therefore consider that unless a large expansion of the automobile industry is planned, all requests for licences for production of piston assemblies and components should be carefully considered. *Prima facie* there is no scope for further expansion of the industry and with the number of existing and prospective units there should be a reasonable measure of competition within the country.

19.3. Producers on their part should make every endeavour to bring down costs and for that purpose maintain adequate systems of cost accounting to assess both their financial and their technical progress. Cost reduction is a continuous process, and every item in the build up of costs, small or large, should be under continuous scrutiny. This industry in common with all industries, has revealed steady rises in costs of production and sales prices which may to some extent be due to the assurance of a protected market. The time has come for a concerted effort to reverse this nation-wide trend.

19.4. A significant reduction of costs in this industry will undoubtedly lead to the opening of export markets not only in this part of the world but even in Europe where we understand the automobile ancillary industries are unable to keep pace with the expansion of the automobile industry.

20. Summary of conclusions and recommedations.

20.1. Our conclusions and recommendations are summarised as under:—

20.2. The Director General of Technical Development should endeavour to arrange for a steady source of pig iron of the rigid metallurgical composition required by the piston assembly industry since off grade pig iron leads to wastages and raw material losses.

[Paragraph 4.5]

20.3. The domestic demand for pistons, piston rings and gudgeon pins for 1966 and 1968 is estimated as under:—

(In millions)

	1966	1968
Pistons	1·66	1·93
Piston rings	14·21	16·29
Gudgeon pins	1·83	2·12

[Paragraph 7.4.4]

20.4. The research work done at the National Metallurgical Laboratory for producing magnesium should be fully exploited to reduce our dependence on imports for this metal and research should be conducted to develop a process for manufacturing silicon for which the basic raw material is available in the country.

[Paragraph 8.6]

20.5. Since equally good results can be obtained by forging cast billets of hypereutectic alloy made indigenously, careful examination is needed whether imported hypereutectic extruded bars are an indispensable raw material for Tata Mercedes-Benz pistons.

[Paragraph 8.6]

20.6. For the reasons given in paragraph 9.4 we reiterate the need for a national policy in regard to aluminium.

[Paragraph 9.4]

20.7. The selection of cylinder bore diameters for internal combustion engines is a matter having a direct bearing on the design and performance of engines and needs careful examination by the engine manufacturers. The engine manufacturers may give due consideration to the Indian Standard Institution's suggestion for adoption of preferred sizes of cylinder bores as given in paragraph 10.1.2. for future engine design.

[Paragraph 10.1.2]

20.8. Escorts Ltd. and Goetze (India) Ltd. should take early steps to introduce a proper cost accounting system and budgetory control for the purpose of reducing costs of manufacture.

[Paragraph 14.1.3]

20.9. Our study of the trends of costs in piston assembly industry reveals prospects of economies of size and that there is a great need for careful cost accounting and for watch over each component of the costs of production.

[Paragraph 15]

20.10. It would be desirable for Government to arrange through D.G.T.D. that manufacturers supply piston assembly and its components direct to all big consumers (even if a commission has to be paid to an authorised dealer on these supplies) so that supplies made to authoried dealers do not become a source of profiteering.

[Paragraph 17.1.3]

20.11. When a manufacturer of piston assembly and its components cannot supply a public utility concern with its requirements within, say six months, necessary import licences should be issued to cover its reasonable requirements.

[Paragraph 17.1.3]

20.12. Since there is scope for reduction in the selling prices of authorised dealers, the manufacturers of piston assembly and components should examine their pricing policy and make suitable reductions in their selling prices, wherever possible.

[Paragraph 17.2]

20.13. Protection to the piston assembly and its components covered by I.C.T. item No. 75(12A) should be continued for a period of three years ending 31st December, 1969 at the existing rates of duty.

[Paragraph 18.3]

20.14. Unless a large expansion of the automobile industry is planned, all requests for licences for production of piston assemblies and components should be carefully considered. *Prima facie*, there is no scope for further expansion of the industry and with the number of existing and prospective units there should be a reasonable measure of competition within the country.

[Paragraph 19.2]

20.15. The piston assembly industry in common with all industries has revealed steady rises in the costs of production and selling prices, which may to some extent be due to the assurance of a protected market. The time has come for a concerted effort to reverse this nation-wide trend.

[Paragraph 19.3]

20.16. A significant reduction of costs in the piston assembly industry will undoubtedly lead to the opening of export markets not only in this part of the world but even in Europe.

[Paragraph 19.4]

Acknowledgements

21. We wish to thank the manufacturers, importers and consumers of piston assembly and Government Departments concerned for their co-operation in connection with this inquiry.

M. P. PAI,
Chairman.

M. ZAHEER,
Member.

K. T. MERCHANT,
Member.

P. V. GUNISHASTRI,
Secretary.

BOMBAY,
Dated: 10*th May,* 1966.

सत्यमेव जयते

सत्यमेव जयते

APPENDIX I

(*Vide* Paragraph 2.1.)

List of Parties to whom questionnaires/letters were issued and from whom replies or memoranda were received.

*Indicates those who have replied.

@Indicates those who are either not interested or those who have no information to furnish.

A. PRODUCERS :

(*i*) *Large Scale Producers*

(a) ***For sale***

*1. India Pistons Ltd., Huzur Gardens, Sembiam, *Madras*-11.
*2. Escorts Ltd., H-2, Connaught Circus, *New-Delhi*-1.
*3. Goetze (India) Ltd., Block H, Connaught Circus, *New (Distt.).*

(b) ***For Self Consumption***

4. Hindustan Motors Ltd., 8, India Exchange Place, *Calcutta*-1.
5. Kulko Engineering Works Ltd., Ichalkaranji, *Kolhapur, (Distt.).*
6. Textool Co. Ltd., Post Box No. 221, Ganapathy P. O., *Coimbatore.*
*7. Lakshmiratan Engineering Works Ltd., Industrial Area No. 1, *Faridabad.*
*8. Cooper Engineering Ltd., Satara Road, (Southern Railway), *Maharashtra.*
*9. The Acme Manufacturing Co. Ltd., Antop Hill, Wadala, *Bombay*-31.

(ii) *Small Scale* ***Producers***

West Bengal

1. Emar (India) Pvt. Ltd., 135, Canning Street, *Calcutta*-1.
2. Machine Parts Ltd., 26/A, Asutosh Mukherjee Road, *Calcutta*-20.

Mysore

3. Auto Electric Works, Dharwar Road, ***Belgaum.***
4. Bharat Engg., & Auto Works, Fort Road, ***Belgaum.***
5. Vijaya Metal Industries, Khanapur Road, ***Belgaum.***

सत्यमेव जयते

6. B. H. K. Sherief & Bros., Jaya Chamrajendra Road, *Bangalore-2.*
7. Rajaram Factory, Bommapur Street, *Hubli.*
*8. Machinery & Spare Parts Producers Coop. Society, Line Bazar, *Dharwar.*
9. Ghodke Bros., Krishnapur, Old Hubli, *Hubli.*

Maharashtra

*10. LA-PRENCA Industries Pvt. Ltd., P. B. No. 7514, Goregaon East, *Bombay*-62.

Rajasthan

*11. Punjab Engg. Works, 14, Misra Market, Outside Sanganeri Gate, *Jaipur.*
12. National Engg. Co., Kripalani Market, Adarsh Nagar, *Jaipur.*

Madhya Pradesh.

*13. Globe Motor Parts Industries, Lohiya Bazar, *Gwalior*-1. (M. P.).

Delhi.

*14. Sakun Engg. Works, 62-A, Dilshad Garden, *Shahdara.*
*15. Maya Industries, 50, M. M. Road, *New Delhi.*
16. Ideal Piston Mfg. Co., Shahzada Bagh, Old Rohtak Road, *New Delhi.*
*17. Maco Pvt. Ltd., E-24, Industrial Area, *Sonepat.*
18. B. A. R. Industries (P) Ltd., 13-DLF, Industrial Area, Najafgarh Road, *New Delhi.*
*19. Paramount Engg. Works, Lal-Kuan, *Delhi*-6.

Punjab.

*20. Auto Piston Mfg. Co., Batala Road, *Amritsar.*
21. Alpa Piston Mfg. Works, Gol Bagh, *Amritsar.*
22. Rattan Automobile Engg. Works, 1604, Sharifpura, *Amritsar.*
23. Auto Engg. Works, Nehru Garden Road, *Jullundur City.*
24. Veer Engg. Works, G. T. Road, *Phagwara.*
25. Pepsu Industries, G. T. Road, *Phagwara.*
26. Auto Valve Industries, Sirhand Road, *Patiala.*
27. N. L. M. Industries, *Faridabad.*

Madras.

*28. Hindustan Pistons (Pvt.) Ltd., 52, Dams Road, Mount Road P. O., *Madras*-2.
*29. Dovell Pistons (Pvt.) Ltd., D-3, Industrial Estate, Ambattur, *Madras*-58.
30 Krimens Pistons, Dupleix Steel, *Pondicherry.*

B. PROSPECTIVE PRODUCERS :

*1. Shama Pistons and Rings Ltd., 14-F, Connaught Circus, *New Delhi.*

2. Nathani Industries Pvt. Ltd., Scrap House, Quay Street, Darukhana, *Bombay*-10.

C. CONSUMERS :

*1. Cooper Engineering Ltd., Satara Road, *Maharashtra State.*

2. Mazagaon Dock Ltd., Dockyard Road, *Bombay*-10.

3. Ruston & Hornsby (India) Ltd., Chinchwad, *Poona*-19.

*4. The Acme Manufacturing Co. Ltd., Antop Hill, Wadala, P. O. Box No. 7102, *Bombay*-31.

*5. The Enfield (India) Ltd., Tiruvottiyur, P. Bag No. 5284, *Madras*-19.

*6. Kirloskar Oil Engines Ltd., Elphinstone Road, Kirkee, *Poona.*

*7. Automobile Products of India Ltd., Bhandup, Agra Road, *Bombay*-78.

*8. Simpson & Co. Ltd., *Madras*-2.

*9. Tata Engineering and Locomotive Co. Ltd., Bombay House, 24, Bruce Street, Fort, *Bombay*-1.

*10. Ashok Leyland Ltd., Ennore, *Madras.*

11. Hindustan Motors Ltd., 8, Royal Exchange Place, *Calcutta*-1.

*12. The Standard Motor Products of India Ltd., 29, Mount Road, *Madras*-2.

*13. Mahindra & Mahindra Ltd., 5, Ferguson Road, Worli, *Bombay*-18.

*14. Southern Roadways Pvt. Ltd., West Veli Street, *Madurai.*

*15. General Manager, B. E. S. T. Undertaking, Best House, P. B. No. 192, *Bombay*-1.

16. The Commissioner, Bombay Municipal Corporation, *Bombay*-1.

*17. The Secretary, Bombay Port Trust, Ballard Estate, *Bombay*-1.

18. The Ahmedabad Municipal Transport, *Ahmedabad.*

19. The Bihar State Road Transport (Central Stores), P. O. B. V. College, *Patna.*

*20. Maharashtra State Road Transport Corporation, Central Stores, Bellasis Road, Byculla, *Bombay*-8.

*21. Calcutta State Transport Corporation, 5, Nilgunge Road, Belghoria, *Calcutta*-56.

*22. Controller of Stores, Western Railway, Churchgate, *Bombay*-1.

*23. Indian National Diesel Engine Co. Ltd., P61, Circular Garden Reach Rd., Kidderpore, *Calcutta*-43.

सत्यमेव जयते

@24. Tractor and Equipment Corporation, Post Box No. 279, 225, Jor Bagh, *New Delhi.*

25. Modern Engg. & Moulding Co., New Kalyan Mills, Naroda Road, *Ahmedabad*-2.

@26. The Goodearth Co., Post Box 672, 16, Asaf Ali Road, *New Delhi*-1.

*27. Veegal Engines & Engineering Ltd., 31, Chittaranjan Avenue, *Calcutta*-12.

*28. Escorts Ltd., 19/6, Mathura Road, *Faridabad (Punjab).*

29. T. V. Sundram Iyengar & Sons Pvt. Ltd., T. V. S. Building, West Veli Street, *Madurai.*

*30. Bajaj Tempo Ltd., 134, A. Besant Road, Worli, *Bombay*-18.

*31. Eicher Tractors India Ltd., Post Box 672, 16, Asaf Ali Road, *New Delhi*-1.

32. Goodearth Manufacturing Corpn. Ltd., Post Box 672, 16, Asaf Ali Road, *New Delhi*-1.

33. Auto Service, Post Box No. 39, Vasco-Da-Gama, *Goa* (India).

34. Indian Commercial Co. Ltd., 45-47, Apollo Street, P. O. Box No. 1621, *Bombay*-1.

35. Premier Auto Electric Pvt. Ltd., 69, Tardeo Road, *Bombay*-7.

36. The Zamindra Engineering Co., P. O. Box No. 7, *Fazilka.*

37. Massey-Furguson (India) Ltd., Post Box No. 3, *Bangalore.*

*38. Premier Automobiles Ltd., Agra Road, *Bombay.*

39. The Director, Assam State Transport, *Shillong.*

40. The Director, Kerala State Transport, *Trivandrum.*

41. General Manager, Andhra Pradesh Road Transport, Murshidabad, *Hyderabad.*

42. Honorary Director, Madras State Transport Department, Mount Road, *Madras*-2.

43. General Manager, Punjab Roadways, *Amritsar.*

44. General Manager, Mysore Government Road Transport Deptt., *Bangalore.*

45. Transport Manager, Poona Municipal Transport, *Poona*-2.

46. Controller of Stores, North Eastern Railways, *Gorakhpur.*

47. Controller of Stores, Central Railway, *V. T. Bombay*-1.

*48. General Manager, Southern Railway, Perambur, *Madras*-23.

49. General Manager, Eastern Railway, *Calcutta.*

50. General Manager, Northern Railway, *New Delhi.*

51. General Manager, South Eastern Railway, *Calcutta.*

52. Chief Administrative Officer, Integral Coach Factory, Perambur, *Madras.*

53. Hind Equipment Corporation, 24-B, Hamam Street, 4th Floor, Raja Bahadur Compound, *Bombay*-1.

54. Machines & Spares (India) Ltd., Fountain View, Darya Ganj, *Delhi*-7.

55. Hindustan Motor Corporation Ltd., 8, Royal Exchange Place, *Calcutta*.

*56. Patel Mavji Kanji & Bros., Jail Gate Road, *Rajkot*.

57. Punjab Oil Expeller Co., G. T. Road, *Ghaziabad*.

*58. Shri Guru Nanak Engg. Co. Ltd., G. T. Road, *Ghaziabad*.

59. Nundy Brothers, 34, Dharamtola Street, *Calcutta*.

60. Lyny Machinery Co. Ltd., 104, Ultadanga Main Road, *Calcutta*-4.

61. Ideal Jawa (India) Ltd., Industrial Estate, *Mysore*-2.

62. Mopeds India Ltd., *Coimbatore*.

*63. Pearl Scooters, 425-427, Industrial Area A, *Ludhiana*.

*64. Bajaj Auto Limited, 134, Dr. Annie Besant Road, *Bombay*-18.

65. Krishi Engines Pvt. Ltd., 2, Denga Bhavan, Rashtrapati Road, *Secunderabad*.

66. Machinery Manufacturers Corpn. Ltd., 'B' Block, Top Floor, Dhanraj Mahal, Apollo Pier Road, *Bombay*-1.

67. Sundaram-Clayton Ltd., 37, Mount Road, *Madras*-6.

68. Roopa Engineering Corpn., 141, Shivaji Udyam Nagar, *Kolhapur*.

69. Jayems Beechy & Co. Pvt. Ltd., Warden House, Sir P. M. Road, *Bombay*-1.

*70. Packo Engineering Pvt. Ltd., P. O. Box No. 105, Shivaji Udyamnagar, *Kolhapur*.

71. Rocket Engineering Corporation, P. B. No. 178, Udyam Nagar, *Kolhapur*.

72. Vishrolia Brass & Iron Works, Digvijaya Plot, *Jamnagar*.

73. Shakti Engineers, Laheripura, New Road, *Baroda*-1.

*74. Javahar Engineers Pvt. Ltd., *Shrirampur* (Distt. Ahmednagar).

75. Gajjar Engineering Works, 29-D, Udyognagar, *Rajkot*.

*76. Sigil (India) Services Pvt. Ltd., Ismail Building, 381, Dadabhoy Navroji Road, P. B. No. 952, *Bombay*-1.

77. The Royal Engineering Co., Post Box No. 5, *Ghaziabad*.

78. Bharat Earth Movers Ltd., Hindustan Aircraft P. O., *Bangalore*-17.

79. Blackwood Hodge (India) Pvt. Ltd., 2, Bhagwan Das Road, *New Delhi*-1.

80. Consolidated Pneumatic Tool Co. Ltd., 301/302, Agra Road, Mulund, *Bombay*-80.

81. Larsen & Toubro Ltd., I. C. House, Dougall Road, Ballard Estate, *Bombay*-1.
82. Tractors India Ltd., 1, Taratolla Road, Garden Reach, *Calcutta*-24.
83. Vulcan-Laval Ltd., Indian Mercantile Chambers, Ballard Estate, *Bombay*-1.
84. William Jacks & Co. Ltd., 16, Netaji Subhas Road, P. O. Box No. 369, *Calcutta*-1.
85. Willcox (Buckwell-India) Ltd., P. O. Box No. 289, *New Delhi*-15.

D. CONSUMERS' ASSOCIATIONS :

1. The Secretary, Engineering Association of India, India Exchange Place, *Calcutta*-1.

@2. Federation of All India Spare Parts Dealers' Associations, 3620/21, Netaji Subhas Marg, Daryaganj (Faiz Bazar), P. B. No. 1052, *Delhi*-6.

3. Automobile Manufacturers' Association of India, India Exchange Place, *Calcutta*-1.
4. The Secretary, Association of Engine Manufacturers, C/o Kirloskar Oil Engines Ltd., Kirkee, *Poona*-3.
5. Bombay Motor Merchants' Association, Sukhsagar, Sandhurst Bridge, *Bombay*-7.
6. Calcutta Motor Dealers' Association, P-6, Mission Row Extension, *Calcutta*.
7. All India Automobile & Ancillary Industries Association, 80, Dr. A. Besant Road, *Bombay*-18.
8. Tractor Earthmoving & Construction Equipment Distributors' Asscn., C/o The Bombay Chamber of Commerce, Mackinnon Mackenzie Building, *Bombay*-1.
9. Indian Road & Transport Development Association Ltd., 27, Bastion Road, *Bombay*-1.
10. Association of Indian Automobile Manufacturers, Army & Navy Building, Mahatma Gandhi Road, *Bombay*-1.
11. Consumers' Association of India, 4, Kashmere Gate, *Delhi*-6.

E. IMPORTERS :

1. Ashok Leyland Ltd., Bank of Mysore Building, N. S. C. Bose Road, *Madras*-1.
2. Greaves Cotton & Co. Ltd., 1, Forbes Street, Post Box No. 91, *Bombay*-1.

*3. Madras Auto Service Pvt. Ltd., 37, Mount Road, *Madras*-6.

4. Martin Burn Ltd., 12, Mission Row, *Calcutta*-1.

@5. Simpson & Co. Ltd., 202/203, Mount Road, *Madras*-2.

*6. India Motor Parts and Accessories Ltd., 1/155, Mount Road, *Madras*-2.

*7. Standard Motor Products of India Ltd., 29, Mount Road, *Madras*-2.

*8. Voltas Ltd., Graham Road, Ballard Estate, *Bombay*.

9. K. B. Thaker & Co. Ltd., P. O. Box No. 1136, Commerce House, 140, Medows Street, *Bombay*-1.

10. Parry & Co. Ltd., Post Box No. 12, *Madras*-1.

11. The Modern Automobiles, 4/17-A, Mount Road, *Madras*-2.

*12. T. V. Sundram Iyengar & Sons Pvt. Ltd., T. V. S. Building, West Veli Street, *Madurai*.

13. Noshir Jehangir & Co., Cumballa Chamber, Cumballa Hill Road, *Bombay*-26.

F. RAW MATERIAL SUPPLIERS :

*1 Indian Aluminium Co. Ltd., 1, Middleton Street, *Calcutta*-16.

*2. The Aluminium Corporation of India Ltd., 7, Council House Street, *Calcutta*-1.

3. Hindustan Aluminium Corporation Ltd., Industry House, 159, Churchgate Reclamation, *Bombay*-1.

4. Eyre Smelting Private Ltd., 5, Hide Road, Kidderpore, *Calcutta*-43.

*5. Madras Aluminium Co. Ltd., Jayalakshmi Race Course, *Coimbatore*.

6. General Manager, Hindustan Steel Ltd., Durgapur Alloy Steel Plant, *Durgapur*.

*7. General Manager, Mysore Iron and Steel Works, *Bhadravati*.

G. GOVERNMENT DEPARTMENTS :

*1. The Director General of Technical Development, (Automobile Directorate), Ministry of Industry and Supply, Udyog Bhavan, *New Delhi*.

*2. The Iron and Steel Controller, 33, Netaji Subhas Road, *Calcutta*-1.

*3. The Development Commissioner, Small-Scale Industries, Udyog Bhavan, *New Delhi*.

*4. The Director, Indian Standards Institution, Manak Bhavan, 9, Mathura Road, *New Delhi*.

*5. The Collector of Customs, Customs House, *Bombay*.

*6. The Collector of Customs, *Madras*.

*7. The Collector of Customs, *Calcutta*

@8. The Collector of Customs, *Cochin*.

*9. The Secretary to the Government of India, Ministry of Defence, *New Delhi*.

*10. The Director of Co-ordination & Statistics, Directorate General of Supplies & Disposals, National Insurance Building, Parliament Street, *New Delhi*.

@11. The Director of Industries, Government of Madras, *Madras.*

*12. The Director of Industries, Government of West Bengal, *Calcutta.*

*13. The Chief Commissioner, Delhi Administration, *Delhi.*

*14. The Secretary to the Government of India, Ministry of Transport and Communications, Department of Transport (Transport Wing), *New Delhi.*

*15. The Director, National Metallurgical Laboratory, *Jamshedpur.*

*16. The Secretary, Council of Scientific & Industrial Research, Rafi Marg, *New Delhi*-1.

17. Hindustan Steel Ltd., 2, Fairline Place, *Calcutta*-1.

18. The Secretary, Engineering Export Promotion Council, World Trade Centre, 14/1 B Eztra Street, *Calcutta*-1.

H. CHIEF SECRETARIES OF STATES :

@1. The Chief Secretary to the Government of Andhra Pradesh, *Hyderabad.*

@2. The Chief Secretary to the Government of Assam, *Shillong.*

3. The Chief Secretary to the Government of Bihar, *Patna.*

*4. The Chief Secretary to the Government of West Bengal, *Calcutta.*

5. The Chief Secretary to the Government of Gujarat, *Ahmedabad.*

6. The Chief Secretary to the Government of Jammu and Kashmir, *Srinagar.*

@7. The Chief Secretary to the Government of Kerala, *Trivandrum.*

8. The Chief Secretary to the Government of Madhya Pradesh, *Bhopal.*

@9. The Chief Secretary to the Government of Madras, *Madras.*

*10. The Chief Secretary to the Government of Maharashtra, *Bombay.*

11. The Chief Secretary to the Government of Mysore, *Bangalore.*

@12. The Chief Secretary to the Government of Orissa, *Bhubaneshwar.*

13. The Chief Secretary to the Government of Punjab, *Chandigarh.*

@14. The Chief Secretary to the Government of Rajasthan, *Jaipur.*

@15. The Chief Secretary to the Government of Uttar Pradesh, *Kanpur.*

*16. The Chief Commissioner, Delhi Administration, *Delhi.*

@17. The Chief Commissioner, Himachal Pradesh, *Simla.*

सत्यमेव जयते

APPENDIX II

(*Vide* paragraph 2.3)

List of factories visited by the Commission and its Officers

Name of the factory	By whom visited	Date of visit
Hindustan Pistons (Private) Ltd., Madras.	Shri M. P. Pai, Chairman Shri M. Zaheer, Member Prof. K. T. Merchant, Member Sri N. Das, Technical Director (Engineering & Metallurgy)	9-2-1966.
India Pistons Ltd., Madras.	Shri M. P. Pai, Chairman Shri M. Zaheer, Member Prof. K. T. Merchant, Member Shri N. Das, Technical Director (Engineering & Metallurgy)	10-2-1966.
	Shri A. K. Banerji, Cost Accounts Officer.	11-1-1966 to 23-1-1966.
Hindustan Motors Ltd., Calcutta.	Shri N. Das, Technical Director, (Engineering & Metallurgy)	20-1-1966.
Escorts Ltd., New Delhi/Bahadurgarh.	Shri M. Zaheer, Member Prof. K. T. Merchant, Member	4-3-1966
	Shri A. K. Ganguli, Assistant Cost Accounts Officer.	5-1-1966 to 6-1-1966 and 9-1-1966 to 11-1-1966.
Goetze (India) Ltd., New Delhi/Bahadurgarh.	Shri M. Zaheer, Member Prof. K. T. Merchant, Member	4-3-1966
	Shri A. K. Ganguli, Assistant Cost Accounts Officer.	5-1-1966 to 6-1-1966 and 9-1-1966 to 11-1-1966.
La-Prenca Industries Private Ltd., Bombay.	Shri M. P. Pai, Chairman Shri M. Zaheer, Member	7-4-1966.
	Dr. P. V. Gunishastri, Secretary Dr. N. V. A. Narasimham, Director (Investigation)	25-2-1966
	Shri N. Das, Technical Director (Engineering & Metallurgy)	21-2-1966 and 7-4-1966.

सत्यमेव जयते

APPENDIX III

(*Vide* paragraph 2·4)

List of persons who attended the Commission's public inquiry on 15th March, 1966

Sl. No.	Name of the representative	Name of the firm/body represented
1	2	3
	A—Producers	
1	Shri M. K. Raju	India Pistons Ltd., Huzur Gardens, Sembiam, Madras-11.
2	,, V. E. Ramamoorthi	
3	,, S. V. Krishnamurthi	
4	,, T. N. Ramaprasad	Goetze (India) Ltd., Block H Connaught Circus, New Delhi-1.
5	,, O. P. Khanna	
6	,, H, D. Jijina	Escorts Ltd., H-2, Connaught Circus, New Delhi.
7	,, Prakash Chander	
8	,, P. N. Brahmawar	La-Prenca Industries Pvt. Ltd. 111-A, Mahatma Gandhi Road, Fort, Bombay-1.
9	,, I. D. Motiani	
10	,, M. L. Aggarwal	Maco Private Limited, 6692/1, Khari Baoli, Delhi-6.
	B—Consumers	
11	Shri K. M. Eapen	Automobile Products of India Ltd., Bhandup, Bombay.
12	,, D. N. Murthy	Tata Engineering and Locomotive Co. Ltd., Bombay House, 24, Bruce Street, Fort, Bombay-1.
13	,, M. H. Narurkar	B. E. S. T. Undertaking, Electric House, Colaba, Bombay-5.
14	,, M. K. Mantri	Maharashtra State Road Transport Corporation, Bellasis Road, Bombay-8.
15	,, S. Johns	
16	,, D. M. Bhave	(1) Bajaj Tempo Ltd., Bombay Poona Road, Chinchwad, Poona-19, and (2) Bajaj Auto Limited, Chinchwad Poona-19.

1	2	3
17	Shri H. N. Gujar	Premier Automobiles Ltd. Agra Road, Bombay.
18	,, P. D. Patel	Sigil (India) Services Pvt. Ltd., Ismail Building, 381 Dadabhoy Navroji Road, Bombay-1.
19	Dr. R. G. Kulkarni	Kriloskar Oil Engines Ltd., Eliphinston Road, Kirkee, Poona.
20	Shri L. M. Shah	H.T. C. Diesel Engines Pvt. Ltd., Beaumon Chambers, 27/33, Nagindas Master Road, (Medows Street), Bombay-1, (B.R.).
21	,, G. C. Shah	
	C—Importers	
22	Shri W. M. Newnes	Voltas Limited, Graham Road, Ballard Estate, Bombay-1.
23	,, C. S. K. Sundaram	
24	,, K. M. Thaker	K. B. Thaker & Co., 110, Commerce House, 140, Medows Street, Fort, Bombay-1.
	D—Raw Material Suppliers	
25	Shri S. P. Shorewala	Hindustan Aluminium Corpn. Ltd., Industry House, 159, Churchgate Reclamation, Bombay-1.
	E—Associations	
26	Shri P. V. Shah	All India Automobile and Ancillary Industries Association, 80, Dr. A. Beasant Road, Bombay-18.
27	,, S. Panikar	
28	,, R. J. Sheth	The Bombay Motor Merchants, Association Ltd., Sandhurst Bridge, Sukh Sagar, Third Floor, Bombay-7.
	F—Observers	
29	Shri K. Gidwaney	Gidwaney's Publishing Co., AMA House, Colaba, Bombay-5.
30	,, I. Almeida	
31	,, M. B. Singh	Hindi Transport Samachar.
32	,, T. W. Balchandani	Automotive Engineer,
33	,, S. I. Padhya	Indian Merchants Chamber.

सत्यमेव जयते

1	2	3
	G—Government Departments	
34	Shri P. S. Rao	Director General of Techni Development, Udyog Bhav New Delhi.
35	,, V. Dorasamy	The Iron and Steel Control 33, Netaji Subhas Ro Calcutta-1.
36	,, S. S. Waravadeker	The Directorate General Supplies & Disposals, N tional Insurance Buildi Parliament Street, N Delhi.
37	,, A. S. Cheema	Indian Standards Instituti Manak Bhavan, 9, Math Road, New Delhi.
38	,, V. A. Phadkar	The Collector of Custo Bombay.
39	,, S. E. Perreira	Controller of Stores, Western Railway, Bombay.

सत्यमेव जयते

APPENDIX IV

(*Vide* paragraph 6.2.1)

Statement showing production—Pistons, Piston Rings and Gudgeon Pins

(In numbers)

Name of Unit	Pistons			Piston Rings			Gudgeon Pins		
	1963	1964	1965	1963	1964	1965	1963	1964	1965
1	2	3	4	5	6	7	8	9	10
A. *Units manufacturing for sale.*									
India Pistons Ltd., Madras. . .	465,242	478,377	531,398	5,498,665	5,344,772	5,441,147	474,359	488,930	523,390
Escorts Ltd., New Delhi . .	275,249	239,879	370,442	..	..	..	..	..	..
Goetze (India) Ltd., New Delhi . .	..	..	..	3,839,986	4,032,389	4,348,489	..	..	..
TOTAL .	740,491	718,256	901,840	9,338,651	9,377,161	9,789,636	474,359	488,930	523,390

1	2	3	4	5	6	7	8	9	10
B. *Units for self consumption*									
Hindustan Motors Ltd., Calcutta . .	43,000	52,000	68,000	..	..	..	..	..	..
Laxmiratan Engineering, Works Ltd., Faridabad. . .	3,525	3,215	3,825	..	..	..	..	..	..
Cooper Engineering Ltd., Satara . .	5,800	6,300	7,700	..	..	..	..	..	..
Acme Manufacturing Co. Ltd., Bombay	820	1,260	1,400	..	..	..	..	..	..
TOTAL .	53,145	62,775	80,925	..	..	..	..	..	..
C. *Small Scale Sector* .	105,625	130,837	122,618	587,825	766,820	905,542	98,256	114,300	160,560
GRAND TOTAL (A+B+C) . .	899,261	911,868	1,105,383	9,926,476	10,143,981	10,695,178	572,615	603,230	683,950

APPENDIX V (*Vide* Paragraph 8.1)

Principal Raw Materials Purchased

Name of the manufacturer and description of raw materials purchased.	1963				1964				1965				Remarks
	Qty. Tonnes	Unit value per tonne	Total value	%age value of indigenous to total	Qty. Tonnes	Unit value per tonne	Total value	%age value of indigenous to total	Qty. Tonnes	Unit valur per tonne	Total value	%age value of indigenous to total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Rs.	Rs.			Rs.	Rs.			Rs.	Rs.		
1. *India Pistons*													
A. *Indigenous*													
Aluminium alloy ingots	302·0	4,655·80	14,06,000		444	4,648·60	20,64,000		465	4,939·90	22,97,000		
Pig iron	1384·0	250·00	3,46,000		617	306·32	1,89,000		1,334	301·34	4,02,000		
TOTAL OF A			17,52,000				22,53,000				26,99,000		
B. *Imported*													
Aluminium alloy ingots	154·0	3,811·00	5,87,000		..	..	..		219	4,840·00	10,60,000		
Pig iron	..	..	..		1192	382·00	4,55,000		..	..	..		
Special alloy steel	275·0	2,070·60	5,68,000		375	2384·95	8,94,000		117·50	2,256·11	2,65,000		
Laminated ring steel strip	2·25	9,778·00	22,000		9·70	12,577·00	1,22,000		7·50	8,667·00	65,000		
Duaflex steel strip	22·95	12,549·00	2,88,000		29·50	16,712·00	4,93,000		..	..	..		
Circlip steel	11·45	1,921·40	22,000		17·60	1,988·63	35,000		10·00	2,500·00	25,000		
TOTAL OF B			14,87,000				19,99,000				14,15,000		
TOTAL A+B			32,39,000	54·1			42,52,000	53·0			41,14,000	65·6	
2. Escorts Ltd.													
A. *Indigenous*													
Pure copper	..	..	..		0·308	8,020·00	2,473·34		*1·114	11,610·00	12,932·28		*for January-November 1965.
Pure aluminium	10·851	3,980·00	43,193·66		62·113	4,120·00	2,55,774·23		*80·370	4,120·00	3,31,124·40		
Pure magnesium	..	..	..		0·160	8,200·00	1,312·12		*0·949	8,800·00	8,349·72		
TOTAL OF A			43,193·66				2,59,559·69				3,52,406·40		

Name of the manufacturer and description of raw materials purchased	1963				1964				1965			Remarks	
	Qty. Tonnes	Unit value per tonne	Total value	%age value of indigenous to total	Qty. Tonnes	Unit value per tonne	Total value	%age value of indigenous to total	Qty. Tonnes	Unit value per tonne	Total value	%gea value of indigenous to total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Rs.	Rs.			Rs.	Rs.			Rs.	Rs.		
B. *Imported*													
Pure Silicon	..	..	..		30·000	2,530·00	75,961·51		*19·500	3,360·00	65,560·68		
138 Alloy (Hypereutectic) extruded rods	145·043	6,720·00	9,74,474·14		242·467	6,990·00	16,93,084·72		*336·452	8,120·00	27,28,859·00		
124 Alloy (eutectic) ingots	73·221	4,720·00	3,45,118·57		40·000	5,170·00	2,06,795·82		..	..	..		
138 Alloy (Hypereutectic) ingots	10·000	4,720·00	47,200·00		..	..	..		..	..	..		
244 Alloy (Hypereutectic) ingots	23·176	4,810·00	1,11,395·90		19·984	4,900·00	97,999·80		*30·000	6,000·00	1,80,110·28		
Pure nickel	..	..	..		0·692	8,900·00	6,158·80		*1·144	8,900·00	10,181·60		
Pure Magnesium	0·766	5,900·00	4,519·10		1·470	5,660·00	8,312·00		*4·103	5,930·00	24,331·38		
TOTAL OR B			14,82,707·71				20,88,312·65				30,09,042·94		
TOTAL A+B			15,25,901·37	2·8			23,47,872·34	11·1			33,61,449·34	10·5	
Goetze (India) Ltd.													
A. *Indigenous*													
Pig Iron L M I	..	..	..		..	..	*44·200	290·05	*44·200	290·05	12,840·37		
Pig Iron L M II	112·940	245·80	27,762·92		68·700	270·60	18,591·64		*22·400	296·80	6,648·77		*Upto November
Pig Iron L M III	..	..	..		..	..	..		*23·800	288·70	6,870·11		
Pig Iron L M IV	185·442	239·70	44,450·00		91·950	276·40	25,416·82		*231·293	281·30	65,052·69		
Ferro Silicon 75%	0·200	1,426·50	285·30		2·200	1,283·10	2,822·86		..	..	..		
Ferro Manganese 50-70%	..	..	..		0·493	943·50	465·15		*0·925	1,147·00	1,060·99		
Silicon Ladelloy	..	..	6,613·42				11,701·46				26,308·35		
Phosphorous Ladelloy	..	..	949·91				..				..		
Manganese Ladelloy	..	..	3,195·00				1,591·00				3,508·80		
TOTAL OF A			83,256·55				60,588·93				1,22,290·08		
B. *Imports*													
Pig Iron (Special)	..	..	..		..	..	..		*3·780	1,267·20	4,790·00		
Ferro Silicon 75-90%	3·000	2,576·20	7,728·68		3·000	2,580·70	7,742·10		*1·427	3,082·40	4,398·60		
Ferro Phosphorous 25%	2·924	1,142·70	3,341·35		3·000	941·60	2,824·80		*2·150	1,324·20	2,846·97		
Ferro Chrome 72%	..	..	..		1·431	3,432·01	4,911·38		*2·777	3,440·70	9,554·91		
TOTAL OF B			11,070·03				1,578·28				21,590·48		
TOTAL A+B			94,326·58	88·3			76,067·21	79·6			1,43,880·56	85·0	

APPENDIX VI

(*Vide* Paragraph 11·1·1·1)

List of models for which Import of Piston Assemblies were Restricted (*Annexure A to Appendix* 26 *of the Red Book* 1963-64)

Make	Year	Model	Bore	I. P. Ref.
1	2	3	4	5
Motor Cycles				
Royal Enfield	1948/56	346 cc, G. 2,350 Bullet	2.571″	10030
Royal Enfield	1953/56	148 cc, 150 Ensign	56 m/m	10065
Cars and Commercial Vehicles				
Austin . .	1937/48	8 HP, Big Seven New Eight, 4 cyl.	2.235″	10071
Austin . .	1947/52	10.65 HP, 1200 cc. A40, Mark I & II Devon, Dorset 4 cyl.	2.5775″	10012
Austin . .	1932/47	10 HP, 1125 cc Ten Four 4 cyl.	2½″	10011
Dodge/Chrysler/Desoto	1941/51	28.36 HP, 6 cyl.	3-7/16″	11003/11081
Fiat . .	1953/56	11.4 HP. 1089cc, New 1100 Series	68 m/m	10142
Ford . .	1939/53 1954/56	10 HP 1172 cc, Prefect, Export Anglia, 10 HP, 1172 cc, Popular	2½″	10070
Ford V/8 .	1937/42	85 and 90 HP	3-1/16″	11041
Ford Mercury	1946/53	32.5 HP, 8 cyl.	3-3/16″	11042/11057
Morris/Morris/Hindustan	1949/56	8 HP, 918 cc, Eight Series'E' Minor Series MM	57 m/m	10018
Wolseley/Morris/Hindustan/Wolseley	1949/56 1949/56	13.4 HP Oxford 4 cyl. 20 HP, O.H.C. 6 cyl.	73.5 m/m	10020

1	2	3	4	5
Perkins . ..		19.6 HP, P4 Diesel 29.4 HP, P6 Diesel.	3.501″	11029
Standard .	1954/58	9.9 HP, 948 cc, O.H.V. Ten	63 m/m	10141
Standard/Triumph.	1948/56	17.0 HP, 20S Vanguard	85 m/m	11022
Willys Jeep Ford GPW Jeep	1939/51	15.6 HP Overland	3-1/8″	1108/11053
Industrial and Stationery Engines				
Petter .		AVI, AVAI,AV, AVA2, Series II AHI Diesel 1/2 cyl.	80 m/m	11011
Petter . .		B Type Series I & II,PBPBY Type Diesel	110 m/m	13015
Ruston		VSH Diesel	4½″	13008
Agricultural Tractors Ferguson		Mark III, TVO., Fuel, 4 cyl.	85 m/m	11025
		T.E.D.20,2088 cc	85 m/m	11039
Ferguson .		OHV.T.V.O Fuel, 4 cyl.		
Ferguson (Ford)	1939/52	9N, 9NAW	3.3/16″	11042/11057

APPENDIX VII (*Vide* Paragraph 16)

Statement showing c.i.f. prices and landed costs of piston assembly and its components

Sl. No.	Source of Information	Origin of import	Date of import	Type and specification	Unit	C.i.f. prices	Customs duty	Clearing charges	Landed cost	Re-marks.
1	2	3	4	5	6	7	8	9	10	11
						Rs.	Rs.	Rs.	Rs.	
	A—Piston Assembly									
1	Collector of Customs, Bombay.	Italy,	16-11-65	Lambretta . .	Pcs.	4·70	70%	5%	8·39	
		U.K.	25-8-65	Perkins . .	Pcs.	15·18	70%	5%	26·56	
		U.K.	24-6-63	Perkins . . .	Sets	22·42	55%	5%	34·90	
		U.K.	22-12-65	Perkins . . .	Pcs.	13·20	60%	5%	23·50	
		Italy	10-2-65	Fiat . . .	Pcs.	35·00	55%	5%	61·10	
		U.K.	4-12-63	Perkins . . .	Sets	30·67	55%	5%	47·78	
		U.K.	22-8-63	Perkins . . .	Sets	21·95	55%	5%	34·10	
2	Collector of Customs, Calcutta.	U.K.	N.F.	Fiat 1100 Part No. 14582-153 mm. and below.	..	9·78	6·85	0·49	17·12	
		U.K.	N.F.	Dodge—Part No. 2061	..	18·00	12·60	1·00	31·60	
		U.K.	N.F.	Willys Jeep—part No. 9167.	..	13·00	9·10	0·70	22·80	
		U.K.	N.F.	Standard 10— part No. 12650.	..	9·12	6·38	0·45	15·95	
		U.K.	N.F.	Standard Vanguard part No. 12332.	..	14·61	10·22	0·73	25·56	
		U.K.	N.F.	Perkins — part No. 1694-06.	..	21·00	14·70	1·30	37·00	
		U.K.	N.F.	Leyland— part No. 903-07.	..	52·00	36·40	2·60	91·00	
		U.K.	N.F.	Hindustan — part No. 12629.	..	11·33	7·93	0·57	19·83	
		U.K.	N.F.	Lambretta . .	..	9·00	6·30	0·45	15·75	

1	2	3	4	5	6	7	8	9	10	11
						Rs.	Rs.	Rs.	Rs.	
3	Standard Motor Products, Madras.	U.K.	21-10-65	Standard 8 model 1954-58 No.	..	13·55	9·48	0·88	23·91	
4	Madras Auto Service P. Ltd., Madras.	U.K.	30-3-64	8142 for Standard below 6″ dia.	per unit*	10·36	5·69	0·15	16·20	*Pistons with pins and rings.
		U.K.	30-3-64	B. 12629 for Hindustan below 6″ dia.	per unit*	18·82	7·05	0·13	20·00	
5	T. V. Sundaram Iyengar & Sons, Madurai.	U.K.	29-5-65	P. No. 164504, Wellworthy for Leyland Comet below 6″ dia.	per unit*	50·00	32·72	1·79	84·51	
	B—Pistons									
1	Collector of Customs, Bombay.	Italy	23-6-65	Lambretta . .	per pc.	6·99	65%	5%	12·10	
		Italy	29-11-65	Do . .	,,	6·51	,,	,,	11·27	
		Italy	4-3-65	Do. . . .	,,	7·65	,,	,,	13·25	
		Italy	5-4-65	Do. . . .	,,	6·99	,,	,,	12·10	
		Italy	5-4-65	Do. . . .	,,	7·65	,,	,,	13·25	
2	Collector of Customs, Madras.	U.K.	17-8-65	Leyland Comet P.No. 523897.	,,	21·73	15·21	0·18	37·12	
3	Collector of Customs, Calcutta.	U.K.	..	Fiat 1100, P.No. 14582	,,	5·88	4·12	0·30	10·30	
		,,	..	Dodge P.No. 2061 .	,,	13·00	9·10	0·70	22·80	
		,,	..	Willys Jeep P.No. 9167	,,	8·00	5·60	0·40	14·00	
		,,	..	Standard 10 P.No. 12650	,,	6·02	4·21	0·30	10·53	
		,,	..	Standard Vanguard P. No. 12332	,,	9·61	6·72	0·48	16·81	
		,,	..	Perkins P. No. 1694-06	,,	15·50	10·85	0·95	27·30	
		,,	..	Leyland P.No. 903-07	,,	38·00	26·60	1·90	66·50	
		,,	..	Hindustan P .No. 12629	,,	7·50	5·25	0·38	13·13	
		,,	..	Lambretta .	,,	6·50	4·55	0·38	11·43	
4	India Motor Parts and Accessories, Madras.	U.K.	..	Leyland—100.626 mm.	,,	36·19	..	..	..	F. O. B.-Rs. 34-46 Freight and insurance Rs. 1·73.
5	Madras Auto Service P. Ltd., Madras.	W. Germany.	3-4-65	Mercedes Benz 90·75. mm. (below 6″ dia).	per set of 6 pistons.	230·97	150·13	2·90	384·00	Pistons with ring but without pins.

1	2	3	4	5	6	7	8	9	10	11
C.—Piston Rings										
1 Collector of Customs, Bombay.	W.Germany	17-7-65	Perkins.		per set	22·90	65%	5%	39·66	
	Italy	16-3-65	Lambretta		per piece	0·35	65%	5%	0·61	
	U.K.	27-9-65	Perkins		per set	23·56	70%	5%	42·05	
	,,	21-6-65	Perkins		,, ,,	23·56	65%	5%	40·82	
	,,	3-9-65	Perkins		,, ,,	23·56	70%	5%	42·05	
2 Collector of Customs, Calcutta.	U.K.	..	Fiat 1100 P. No. 14582		,, ,,	2·50	1·75	0·13	4·38	
	,,	..	Dodge P.No. 2061		,, ,,	3·00	2·10	0·20	5·30	
	,,	..	Willys Jeep P.No. 9167		,, ,,	3·25	2·27	0·20	5·72	
	,,	..	Standard Vanguard P. No. 12332.		,, ,,	3·00	2·10	0·15	5·25	
	,,	..	Perkins P. No. 1694-06		,, ,,	3·50	2·45	0·25	6·20	
	,,	..	Leyland P.No. 903-07		,, ,,	9·00	6·30	0·45	15·75	
	,,	..	Hindustan P.No. 12629		,, ,,	2·50	1·75	0·13	4·38	
	,,	..	Lambretta		,, ,,	1·20	0·84	0·06	2·10	
D.—Gudgeon Pins										
1 Collector of Customs, Bombay.	W. Germany	12-8-65	Fiat		..	2·46	65%	5%	4·25	
	,,	12-8-65	Perkins		..	3·29	65%	5%	4·64	
	,,	18-10-65	Dodge		..	1·52	70%	5%	2·60	
	,,	18-10-65	Fiat		..	2·46	70%	5%	4·38	
2 Collector of Customs, Calcutta.	U.K.	..	Fiat 1100 P. No. 14582		..	1·40	0·98	0·07	2·45	
	,,	..	Dodge P. No. 2061		..	2·00	1·40	0·10	3·50	
	,,	..	Willys Jeep P.No. 9167		..	1·75	1·23	0·10	3·08	
	,,	..	Standard 10 P.No. 12650		..	1·10	0·77	0·05	1·92	
	,,	..	Standrd Vanguard P.No. 12332.		..	2·00	1·40	0·10	3·50	
	,,	..	Perkins P.No. 1694-06		..	2·00	1·40	0·10	3·50	
	,,	..	Leyland P. No. 903-07		..	5·00	3·50	0·25	8·75	
	,,	..	Hindustan P.No. 12629		..	1·33	0·93	0·07	2·33	
	,,	..	Lambretta.		..	1·30	0·91	0·07	2·28	

GIPN—S1—12 T. C. Bom./66—29-1-68—400

सत्यमेव जयते